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AN EXPLORATORY STUDY OF THE WAYS READERS IN GRADES 4, 6, AND 8 PROCESS THE CONTEXT TO OBTAIN WORD MEANING

by

© WILMA WINNIFRED LAING

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "An Exploratory Study of the Ways Readers in Grades 4, 6, and 8 Process the Context to Obtain Word Meaning" submitted by Wilma Winnifred Laing in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

The use of context as an aid to word meaning has long remained an area of conjecture and concern. In particular, little is known about the process of learning to derive word meaning from context. Therefore, an exploratory study was designed to determine how fifty-four subjects, representing Very Proficient, Proficient, and Less Proficient readers in grades 4, 6, and 8, processed the context to obtain word meaning.

To provide appropriate reading tasks for three grades, the investigator constructed two reading tests. In the F. W. Tests - Sentences and Paragraphs familiar words deleted were equally represented by nonsense words and blank spaces. Words underlined in the U. F. W. Tests - Sentences and Paragraphs were unfamiliar to each individual as determined by a vocabulary pretest administered during the same interview.

During two tape-recorded individual interviews, each subject was induced to supply a word or word meaning for the test item before explaining, in retrospect, how meaning was obtained and how much reading was required before the response came to mind. A battery of word fluency tests was administered to determine the relationship between word fluency and ability to derive word meaning from context.

Classification schemes, derived from subjects' responses, made possible quantitative measurement of qualitative judgments in relation to the quality of the word or word meaning elicited, the number of meaning cues reported, and the reasoning used to obtain the response.

Statistical treatment of the data consisted of two-way analysis of variance, single factor experiments with repeated measures, and correlated t tests on selected variables. Coefficients of correlation were also calculated on selected variables.

Results of the study revealed that maturing, proficient readers in grades 4, 6, and 8 tended to abstract and select meaning cues for analysis by reasoning in order to integrate or accommodate the derived word meaning within the verbal context. Although similarities in processing patterns were revealed across the grades, there was a significant increase by grade in the success with which subjects obtained a familiar word. While success in deriving the meaning of an unfamiliar word from context tended to increase by grade, differences were not significant.

Grade 4 subjects experienced considerably greater success with unfamiliar words over familiar words. For subjects in grades 6 and 8, results were comparable for both tasks.

Across the grades the Very Proficient reading groups were significantly more efficient in using meaning cues, in reasoning, and in controlling the language used to complete contextual meaning than were the Proficient and Less Proficient reading groups. Although the Less Proficient reading groups tended not to be significantly less successful than were the Proficient reading groups, their scores fluctuated more frequently.

Subjects obtained acceptable words or word meanings during five reported processing "times." The largest proportion of acceptable

responses was obtained "at the end of first reading" of the context.

Reading to obtain a familiar word deleted from the context or an unfamiliar word underlined in the context was, for the subjects in the study, a demanding language-thinking task.

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

> In our highly verbal culture an accurate understanding of the meaning of words is a necessary prerequisite for reading with meaning . . . . The development of a reading vocabulary is a necessary phase of good comprehension (Harris, 1956, p. 397).

Few would disagree with Harris' (1956) statement. Concern for vocabulary development is reflected in the professional literature, in the quantity of reported vocabulary studies, and in the variety of available instructional materials. Nevertheless, many maturing readers have difficulty in reading comprehension which seems to stem from failure to attach appropriate meaning to words -- words not in isolation but within the confines of written context. In spite of teachers' sincere efforts, numerous learners fail to develop a meaning vocabulary, the "necessary prerequisite for reading with meaning."

Cole's point of view, expressed in 1946, serves to convey a similar concern of the 1970's in that she stated:

> In all probability, an inadequate vocabulary is the greatest single cause for failure to read with comprehension in either technical or general fields (p. 40).

More recently, Langer (1967), referring to high school students (the products of our elementary schools), commented that the difficulty in reading comprehension frequently stems from failure to attach meaning to words and the concepts or ideas they represent. By contrast, the good reader, aware of the importance of the qualitative characteristics of words and ideas, strives continuously to increase his reading power as represented by the dimensions of his word meaning bank -- its depth, breadth, and height. The mere use of a word by a child or by a college student is no guarantee that its meaning has been grasped (McCullough, 1959, p. 102). It is possible that the tendency to accept the point of view that "if you can recognize a word at all, you can use it (Russell, 1954, p. 321)," too frequently prevails.

However, the quantity of studies reported bears witness to a continuing concern for vocabulary although the direction taken by the majority of these investigations leads one to ask: "Concerned about what?" Lists of completed vocabulary studies attest to interest in word frequency counts, word difficulty, correct usage, experimental studies on instruction for the purpose of improving vocabulary, as well as the relation of vocabulary and intelligence, vocabulary and reading, and the like (Dale & Razik, 1963). In spite of limitations, many of these studies have made a valuable contribution in terms of providing information concerning both the quality and the quantity of words used by developing readers.

Of the many ways suggested for expanding a child's vocabulary, one that is closely associated with reading comprehension is that of using context as an aid to word meaning. While there appears to be many ways in which the individual comes to "know" what a word means, the usefulness of verbal context as one means of "getting to know" what a particular word means in that particular context seems feasible. There is, however, little research to support this notion.

Nevertheless, it has long been assumed that verbal context provides important cues to help the reader obtain word meaning. Chambers (1904) claimed that "the commonest and perhaps the best way" to provide vocabulary growth was to allow pupils to infer word meaning from the context. He suggested further that pupils should have "little trouble" in "getting the sense" of the context, providing the number of unfamiliar words was limited and their use in the context was varied (p. 50). Over the years, recognized authorities in the reading field (Thorndike, 1917; Artley, 1943; Russell, 1949; and Spache, 1963) expressed their consensus on the usefulness of context to derive word meaning.

As early as 1943 McCullough attempted to gain information from college students concerning how they obtained word meaning from context. In spite of limited research to support her views, McCullough continued to stress the importance of helping pupils make more efficient use of the context. She maintained that "the verbal woods are full of context aids to reading. . .which are best effected by direct teaching and continuous attention (McCullough, 1958, p. 225)." However, McCullough (1958) admitted that application of the necessary techniques were not realized because "we did not know well enough what they were or how to teach them (p. 229)." Nevertheless, she pointed to a possible direction which research might take when she wrote:

> We recognize that the good reader not only observes words carefully if necessary, but also thinks of the relationship of these words to each other and to the sense of the whole. This second attribute of a good reader is still an area of considerable ignorance among us (1958, p. 225).

At the present time, little is known concerning how the "good reader" operates in the process of obtaining word meaning from context.

McKee (1948) maintained that many necessary concepts could be built while reading, if the strange word was accompanied by an explanatory context which was sufficiently detailed and familiar and, if the reader had the skill to use it (p. 73). Both Russell (1949) and Gray (1960) stressed the importance of helping young children realize the advantage of context as a guide to meaning by making certain that the unfamiliar word "made sense" in the context. Dechant (1964) also wrote in support of helping children develop skill in using the context, pointing up the need to help children "decipher the writer's rhetorical and grammatical contrivances" in order to obtain the intended meaning of the context (p. 351).

Although the ideas expressed by these expert opinions seem to make considerable sense, there is, at present, little research to support these ideas. It is not known how proficient readers across the grades process the context in order to determine the relationship of words to each other and to the sense of the whole context. In particular, it is not known how proficient readers use the context to obtain the meaning of an unknown word in it. What skills, abilities, or strategies the proficient reader brings to the task of obtaining word meaning from context is largely a matter of conjecture. If, however, the reading for meaning process is to be fully comprehended, there is need for specific information concerning how the context is used by young readers seeking word meaning from it.

The abundance of articles written and the research studies reported during the past twenty-five years bear witness to a concern for the use of context as an aid to word meaning. A major criticism of completed research in this area was conveyed by Aulls (1971) when he wrote:

> Because of the clue categories, the response measures, the characteristics of the sample populations, the conditions under which subjects were selected and tested differed markedly, the findings have been diffuse. Often clues were labeled differently but were not mutually exclusive. The clues assumed to be critical segments of context were not clearly unique and were not substantiated on grounds other than opinion (p. 63).

From a more positive standpoint, the research seemed to clearly indicate the need to examine the use of contextual clues in relation to the process itself in order to determine whether proficient readers, differing in age, used the same skills and strategies to obtain word meaning from the context. According to Aulls (1971), percentage use of contextual clues ranged from 22 per cent in grade three to 85 per cent at college level (p. 62). These figures seemed to suggest that, before attempting to develop more effective instructional practices or instructional materials in reading, relative to the use of context, there is a need to focus research more directly upon the learner. Significant insight into how the individual processes meaning is needed. In particular, how the reader as a learner attaches meaning to an unfamiliar word in context is an area about which little is known. It is presently impossible to examine thought processes directly: it is not impossible, however, to investigate them indirectly.

Purpose of the Study

The purpose of the study was to explore how word meaning was obtained from verbal context by young maturing readers, designated as very proficient, proficient, and less proficient readers in grades 4, 6, and 8. More specifically, the main aim of the study was twofold: (1) to explore how young maturing readers, representing three grade levels, grades 4, 6, and 8, obtained the meaning of an unknown word from the context, either a familiar word deleted from the context or an unfamiliar word underlined in the context of sentences and paragraphs; and (2) to determine how efficiently young maturing readers, representing three grade levels, grades 4, 6, and 8, used five selected types of contextual clues specifically embedded in the context as possible aids to word meaning.

As a result of the study, it was considered a possibility that the information obtained would be sufficiently significant to warrant further research along similar lines. Eventually it might then be possible to generalize and describe how proficient maturing readers, at each stage or level of development, process verbal context to obtain word meaning.

Plan of the Study

To achieve the purpose of the study it was not possible to observe reading behavior directly but it was possible to make indirect observations which were assumed to reflect the process of obtaining word meaning from context. Therefore, fifty-four subjects in grades 4, 6, and 8 were selected on the basis of their performance on a standardized reading test to represent very proficient, proficient, and less proficient readers, varying in age and in grade level. During two taped interviews with each subject, introspective techniques were used to obtain information concerning how word meaning was obtained from reading passages; that is, after the word or word meaning response was elicited for each reading task, the subject was asked to explain, in retrospect, how he decided upon that particular response. From an analysis of subjects' verbal explanations of how word meaning was obtained, patterns of reading behavior evolved which made it possible to conclude the study with inferences made concerning the psychological reality of the reading process of deriving word meaning from context. Before such inferences were made, however, several major steps were taken in the study.

First, there was the task of developing appropriate reading passages (sentences and paragraphs) for young maturing readers representing three grade levels. For that purpose two types of reading tasks were constructed in the form of reading tests. One series of tests was designed to determine how a familiar word deleted from the context was obtained; the other series of tests was constructed to determine how the meaning of an unfamiliar word underlined in the context of sentences and paragraphs was obtained. In addition, a battery of word fluency tests was compiled to determine relationships between ability to obtain word meaning and word fluency.

No predetermined classification scheme, based on expert opinion or upon existing plans, was used for analyzing subjects' responses. Instead, the experimental data determined how the responses should be classified in order to make interpretation of the data possible. Subsequently, the four schemes which evolved for classifying subjects' responses in terms of both process and product were unique and comprehensive.

Moreover, the description of how subjects obtained word meaning from context was not entirely dependent on subjective judgment. Quantifying measurement of the qualitative judgments made in classifying subjects' responses was obtained for three out of the four classification schemes devised.

Definition of Terms

For the purpose of this study the meanings attached to certain terms were as follows:

Context

Context refers to the parts of the written discourse which surround a word and which govern the interpretation of the word

(Ames, 1965).

The term "using the context" refers to using information provided by the context in such a way that word meaning is obtained from the context.

Contextual clue

A contextual clue refers to that part of the verbal context specifically embedded to aid the reader in determining the meaning of an unknown word.

Familiar word

A familiar word in the study refers to any word listed in the first column of the Thorndike & Lorge (1944) word list having a frequency of occurrence of 20 times or more per million words.

Unfamiliar word

An unfamiliar word refers to any word for which a subject was unable to elicit an acceptable meaning when the word was presented to him in isolation as part of the vocabulary pretest. In reading tasks unfamiliar words were underlined.

An unknown word

In this study an unknown word is either a familiar word deleted from the context or an underlined unfamiliar word in the context for which the reader seeks meaning.

Nonsense word

A nonsense word is an arbitrarily designed simulated word having no lexical meaning and created to replace an actual word deleted from the context.

Word form class

Word form class refers to four classes of words traditionally designated nouns, verbs, adjectives, and adverbs. In the English language they are the words which carry meaning.

Very proficient reader

A very proficient reader is a subject whose vocabulary score and comprehension score on the criterion screening test, the reading subtests of the Canadian Tests of Basic Skills (C.T.B.S.), were above the 85th percentile. Such a reader was placed in the Very Proficient reading group.

Proficient reader

A proficient reader is a subject whose vocabulary score and comprehension score on the criterion screening test, the reading subtests of the Canadian Tests of Basic Skills, were above grade placement level but below the 85th percentile. Such a reader was placed in the Proficient reading group.

Less proficient reader

A less proficient reader is a subject whose vocabulary score was at grade placement level or above but his comprehension score was at least one year below his vocabulary score on the criterion screening test, the reading subtests of the Canadian Tests of Basic Skills. Such a reader was placed in the Less Proficient reading group.

Development of Research Questions and Hypotheses

Research questions in keeping with the purpose of the study were formulated. When the analysis of Ss' responses revealed the nature of the empirical information available, the research questions were pursued through null hypotheses. Consequently, qualitative descriptive analyses of the experimental data were reinforced by quantitative measurement.

The research questions posited and the null hypotheses tested were as follows:

Research question I

How do Very Proficient, Proficient, and Less Proficient reading groups in grades 4, 6, and 8 obtain a familiar word deleted from the context of a sentence and of a paragraph?

Hypothesis 1.10: for sentences

There is no significant main effect due to group or grade on

1.11 the number of meaning cues used to obtain a familiar word deleted from the context;

1.12 the reasoning used to obtain a familiar word deleted from the context;

1.13 the quality of the word elicited to represent a familiar word deleted from the context.

Hypothesis 1.20: for paragraphs

There is no significant main effect due to group or grade on

1.21 the number of meaning cues used to obtain a familiar word deleted from the context;

1.22 the reasoning used to obtain a familiar word deleted from the context;

1.23 the quality of the word elicited to represent a familiar word deleted from the context.

Research question 2

How do Very Proficient, Proficient, and Less Proficient reading groups in grades 4, 6, and 8 obtain the meaning of an unfamiliar word underlined in the context of a sentence and of a paragraph?

Hypothesis 2.10: for sentences

There is no significant main effect due to group or grade on

2.11 the number of meaning cues used to obtain the meaning of an unfamiliar word underlined in the context;

2.12 the reasoning used to obtain the meaning of an unfamiliar, word underlined in the context;

2.13 the quality of the meaning elicited for an unfamiliar word underlined in the context.

Hypothesis 2.20: for paragraphs

There is no significant main effect due to group or grade on

2.21 the number of meaning cues used to obtain the meaning of an unfamiliar word underlined in the context;

2.22 the reasoning used to obtain the meaning of an unfamiliar word underlined in the context;

2.23 the quality of the meaning elicited for an unfamiliar word underlined in the context.

Research question 3

Is there a difference across the grades in the Ss' ability to obtain a familiar word deleted from a sentence and a paragraph in relation to

(a) its word form class?

(b) each of the five selected types of contextual clues (Language experience, Cause and effect, Direct description, Contrast, Synonym) of which at least one is embedded in each context?

Hypothesis 3.0

There is no significant difference across the grades in the Ss' ability to obtain a familiar word deleted from the context of a sentence and a paragraph in relation to

3.1 its word form class;

3.2 each of the five selected types of contextual clues (Language experience, Cause and effect, Direct description, Contrast, Synonym) of which at least one is embedded in each context.

Research question 4

Is there a difference within grades in the Ss' ability to obtain a familiar word deleted from the context of a sentence compared to a paragraph?

Hypothesis 4.0

There is no significant difference within grades in the Ss' ability to

4.1 reason the familiar word deleted from the context of a sentence and a paragraph;

4.2 obtain the familiar word deleted from the context of a sentence and a paragraph.

Research question 5

Is there a difference within grades in the Ss' ability to obtain the meaning of an unfamiliar word underlined in the context of a sentence compared to a paragraph?

Hypothesis 5.0

There is no significant difference within grades in the Ss' ability to

5.1 reason the unfamiliar word underlined in the context of a sentence and a paragraph;

5.2 obtain the meaning of the unfamiliar word underlined in the context of a sentence and a paragraph.

Research question 6

Is there a difference within grades in the Ss' ability to obtain a familiar word deleted from the context of a sentence and a paragraph, depending on whether the missing word is represented by a nonsense word or a blank space?

Hypothesis 6.0

There is no significant difference within grades in the Ss' ability to obtain a familiar word represented by a nonsense word and a blank space

6.1 in the context of a sentence;

6.2 in the context of a paragraph.

Research question 7

Is there a difference in the way Ss within grades obtained a familiar word deleted from the context and the meaning of an unfamiliar word underlined in the context of a sentence and a paragraph?

Hypothesis 7.10: for sentences

There is no significant difference within grades in the Ss' ability to obtain a familiar word deleted from the context and the meaning of the unfamiliar word underlined in the context as revealed by

7.11 the reasoning used;

7.12 the quality of the familiar word and the quality of the meaning of an unfamiliar word.

Hypothesis 7.20: for paragraphs

There is no significant difference within grades in the Ss' ability to obtain a familiar word deleted from the context and the meaning of an unfamiliar word underlined in the context as revealed by

7.21 the reasoning used;

7.22 the quality of the familiar word and the quality of the meaning of the unfamiliar word.

Research question 8

What is the relationship within grades between the Ss' ability to obtain an unknown word, either a familiar word deleted from the context or the meaning of an unfamiliar word underlined in the context of a sentence and a paragraph, and word fluency?

Hypothesis 8.0

There is no significant relationship between word fluency and the Ss' ability to obtain

8.1 a familiar word deleted from the context of a sentence;
8.2 a familiar word deleted from the context of a paragraph;
8.3 the meaning of an unfamiliar word underlined in the context of a sentence;
8.4 the meaning of an unfamiliar word underlined in the context of a paragraph.

Research question 9

What is the relationship within grades between how the Ss obtained the unknown word and its quality, either a familiar word deleted from the context or the meaning of an unfamiliar word underlined in the context of a sentence and a paragraph?

Hypothesis 9.10: for sentences

There is no significant relationship within grades between the number of meaning cues used by the Ss and the quality of

9.11 the word elicited to represent a familiar word deleted from the context;

9.12 the meaning obtained for an unfamiliar word underlined in the context.

Hypothesis 9.20: for paragraphs

There is no significant relationship within grades between the number of meaning cues used by the Ss and the quality of

9.21 the word elicited to represent a familiar word deleted from the context;

9.22 the meaning obtained for an unfamiliar word underlined in the context.

Hypothesis 9.30: for sentences

There is no significant relationship within grades between the number of meaning cues and the reasoning used by the Ss to obtain

9.31 the familiar word deleted from the context;

9.32 the meaning of an unfamiliar word underlined in the context.

Hypothesis 9.40: for paragraphs

There is no significant relationship within grades between the number of meaning cues and the reasoning used by the Ss to obtain

9.41 the familiar word deleted from the context;

9.42 the meaning of an unfamiliar word underlined in the context.

Hypothesis 9.50: for sentences

There is no significant relationship within grades between the Ss' ability to reason and the quality of

9.51 the word elicited to represent a familiar word deleted from the context;

9.52 the meaning obtained for an unfamiliar word underlined in the context.

Hypothesis 9.60: for paragraphs

There is no significant relationship within grades between the Ss' ability to reason and the quality of

9.61 the word elicited to represent a familiar word deleted from the context;

9.62 the meaning obtained for an unfamiliar word underlined in the context.

Research question 10

Is there a relationship between the Ss' ability to obtain word meaning from context and personal experience?

Research question 11

What is the relationship between the Ss' ability to obtain a familiar word from the context of a sentence and the position of the deleted word in the context?

No null hypotheses were generated for research questions 10 and 11 because descriptive analyses were considered more appropriate.

Assumptions

The investigation was based upon the following assumptions:

1. It was assumed that the tasks presented to the subject provided a valid means of obtaining a verbal description of how he processed the meaning of an unknown word from the context.

2. It was assumed that the inferences made from the verbalized description of how the subject obtained the meaning of an unknown word from the context might be the same as the psychological reality of the process.

Limitations of the Study

Limitations of the study were as follows:

1. Although an artificial situation was created in the F. W. Tests - Sentences and Paragraphs in that the actual word was replaced by a blank space or a nonsense word and considered to be the equivalent of obtaining word meaning for an unknown word, this appeared to be the most appropriate method available.

2. While verbal responses and experiences of reasoning may not be identical with the thinking process, they do reveal the formulations of which the subject was conscious.

3. The subject was confined to deriving word meaning from a restricted context. These restrictions may limit what was learned concerning the process of obtaining word meaning from context.

4. The reading situation was not normal in that the subject was asked to verbalize his thoughts concerning how he obtained word

meaning at the end of each test item. The subject, realizing that he would be required to explain how word meaning came to mind, may have been influenced by this factor during the reading of subsequent sentences and passages. Furthermore, the subject may have been inhibited by the presence of a tape recorder on which his responses were recorded.

Significance of the Study

This study was significant in that it provided an opportunity to gain insight into the process of word meaning. It was a first attempt to explore by means of introspective techniques how developing readers in grades 4, 6, and 8 obtained word meaning from context. More specifically, it was a first attempt to explore how developing readers obtained the meaning of an unknown word from the context of both sentences and paragraphs. Furthermore, it was not assumed that obtaining meaning for an unknown word (i.e. a familiar word deleted from the context) was the same as obtaining meaning for an unfamiliar word. Instead, an attempt was made to determine how subjects obtained a familiar word deleted from the context and how they obtained the meaning of an underlined unfamiliar word in the context in order that both processes might be examined.

It was not intended that this study would provide sufficient information which could be translated directly into classroom practice. Rather the intent was that, if the information obtained from the fifty-four subjects' responses to the given reading tasks was significant, it could provide direction for further research in an area of major concern. Therefore, the real significance of this study depends largely on whether or not it generates further research to determine how word meaning is processed from the context by young maturing readers.

Overview of Plan for Reporting the Investigation

The report of the investigated is presented as follows:

1. Chapter II contains the basic theoretical framework and a review of the literature relevant to the study.

2. Chapter III describes the design of the study while Chapter IV describes the construction of the experimental instruments.

3. Chapter V provides an overview of how the experimental data from both Context Tests were analyzed as well as details of how the experimental data obtained from the F. W. Tests - Sentences and Paragraphs were analyzed.

4. Chapters VI to VIII report the results of the investigation. In Chapter IX the summary of findings, conclusions, and implications of the study are presented.

CHAPTER II

THE BACKGROUND OF THE STUDY

The purpose of this chapter is to provide a review of relevant theory and research from which evolved a theoretical framework for an exploratory study of how maturing proficient readers obtained word meaning from context. First, the nature of context, the meanings attached to words in context, and the possible psychological and linguistic factors which seem to influence the process of deriving word meaning from context were examined. Such information was considered valuable for the purpose of developing the experimental reading tasks and for interpreting the results of the experimental study.

The remaining portion of this chapter is given to a review of the literature more directly concerned with the role of context in the reading process. It includes a review of relevant studies reporting use of context by readers, differing in age and in ability. The chapter concludes with a review of selected research using introspective techniques to examine the reading and thinking processes, followed by a brief overview of the conceptual framework for the study.

The Nature of Context

Because reading involves interpretation of written context, reading experts tend to make reference to use of context more frequently than to identify what context is. Gray (1940) defined context as the "meanings of the other words in the same sentence or paragraph which have a bearing on the word in question (p. 22)." McKee (1948) described context as follows:

> Context has been used to refer chiefly to the printed words with which the strange word is associated in the reading matter and which determines or explains the meaning of that word (p. 74).

McKee (1960) explained context as "the sense of what words and groups of words that come before, after, or both before and after the strange word are saying (p. 98)." Zahner (1940) agreed that, in a very narrow sense, verbal context referred to "the other words in the passage" but only as "the clue to the present situation (p. 91)." He maintained that consideration should also be given to the past experiences of the reader in terms of what he already knows in other situations, making it possible for the reader to compare or contrast this particular situation before selecting portions relevant to it. In addition, Zahner (1940) implied that written context is not merely a linear equation of fixed knowns, conveying the "sense meaning"; it contains also the meanings or ideas intended by the writer, either stated or implied (pp. 84-85). Most reading specialists would agree that the reading process involves interaction between reader and writer, employing some sort of language system (Kingston, 1968, p. 427).

From the semantic point of view, the definitions given serve only as a starting point. According to Walpole (1941), a symbol can have no meaning apart from its context but contexts are not always words. Besides symbolic contexts (the network of words or symbols known by the individual), there are physical and psychological contexts which cannot be ignored. Physical context, the total context of existing things, varies within the individual in relation to his contacts with parts of the physical world. The psychological context refers to the way the individual puts together his experiences with words and objects, weaving them together to create his own way of thinking, his own Weltanschauung (Walpole, 1941, p. 115). This point of view, closely aligned to the Whorfian world view, seems to suggest that each individual experiences and conceives the world (i.e. the context of words and things) in his own unique way. Moreover, the language or symbols man uses to communicate his ideas and feelings tend to be causally related to these psychological differences.

Consideration of these three contexts seemed relevant to this study, not only in the preparation of the written context which the subjects read in order to obtain word meaning, but also in the interpretation of their responses. It was not known, in the beginning at least, how the overlapping of words, thoughts, and things, occurring within the context as conceived by the investigator might be interpreted by the reader. According to Walpole (1941), there is no such thing as "the right word or the right way" of making a certain statement since its interpretation depends upon the experience of the recipient of the message.

Hayakawa (1941) spoke of the physical and social context as if they operated as one. He claimed that it was through actual experience with a word in a particular setting that the individual comes to "know the word" meant for a particular context. For example, an individual might hear the term "slice" being used by his golfing companions. Although he might never before have heard the word used in such a context, the individual, an intelligent user of language, would have no difficulty in such a social and physical setting (the friendly golf game) in understanding what the "new" word meant (Hayakawa, 1941, p. 59).

In preparing reading tasks for children of three grade or age levels, the nature of verbal context, in terms of its relevance to the reader, was considered. Topics were chosen which allowed the individual to move as freely as possible from one written context to another in his efforts to obtain word meaning in more than one type of contextual situation. An attempt was made to provide situational contexts within the experiences of children between the ages of nine to fourteen years, particularly in relation to everyday happenings and to school subjects.

Frye (1969) stated that attention in reading may move in two directions at once: one direction, centripetal, in order to get meaning out of what is there in the context and the other, centrifugal, outside of what is being read and residing in the memory (p. 1). He suggested further that non-literary information might require the reader to use the first direction while literary writing tended to make full use of both types.

Words and Word Meanings in Context

A word can have no meaning apart from its context (Walpole, 1941, p. 115). By stating further that a word is not known without having some thoughts about it, Walpole (1941) was perhaps, suggesting that language and thought are interwoven. For Vygotsky (1962), the meaning of a word represented an amalgam of thought and language. He wrote:

> A word without meaning is an empty sound; meaning, therefore, is a criterion of "word", its indispensible component (p. 120).

The relation of thought to word is a process with a continual movement both ways -- from thought to word and from word to thought. Moreover, thought is not merely expressed in words, it comes into existence through them (Vygotsky, 1962, p. 125). That is, once concepts have matured, the word, complete with meaning, is nearly always available, making it possible for people to communicate (Vygotsky, 1962, p. 7).

With respect to the word in context, Vygotsky (1962), said:

> A word in a context means both more and less than the word in isolation; more, because it acquires a new context; less, because its meaning is limited and narrowed by the context (p. 146).

Watts (1944) conveyed a similar idea in slightly different yet simple terms, using the word light as an example. In a word frequency count it is allotted one meaning but when used in context offers numerous possibilities (p. 128). With this concept Wardhaugh (1969) seemed to agree but added that, although word meanings differ, there is need for precision as determined by the use of a word in context. The meaning of a sentence is not the sum of the meaning of its words but a fusion of syntactic structure and semantic properties of the individual word (p. 88). Moreover, the word used in different contexts with varying grammatical functions, is highly dependent for interpretation on the thought processes of the reader and his experiential background, as demonstrated in the following sentences:

The engineer fired his assistant.

The engineer fired the gun which killed his assistant.

The engineer fired questions at his assistant.

The engineer fired a steam boiler early in his career.

Although the word fired represents the same word form class in each sentence its precise meaning in each context is dependent on the word following and, in relation to the reader's ability to differentiate meanings required in each example. Russell (1954) pointed out the need to identify how precision of word meaning is obtained in terms of discrimination and explicitness of use. No research reports were found which attempted to solve this problem.

Not only the words but the structure of the sentence must be considered, for meaning to be conveyed. In the sentence, "They are hunting dogs," the word "hunting" is dependent for its meaning upon the grammatical role it plays in the sentence (Miller, 1967, p. 341). When the reader combines language and thinking power, he is able to interpret what the word "hunting" means, provided additional meaning cues are located in preceding or following contexts, making it possible for the reader to decide whether the dogs were doing the hunting or were being hunted.

Combining the linguistic, psychological, and philosophical point of view, Rommetveit (1968) offered a concise explanation in terms of selective restrictions imposed by context on word meaning. The constraints placed upon word meaning by a particular context serve to aid the reader,delimiting the possibilities and thereby aiding in the problem solving task. As pointed out by Rommetveit, the word "water" in the context of a chemistry book arouses associations considerably different from the same word used in a poem. That is, "drinkability will most likely be a dominant feature of reference" in the context of a poem about the "burning thirst of a nostalgic Norwegian sailor " but "fragments of chemical knowledge and the ecology of the chemistry laboratory" may dominate the thoughts of the student reading the chemistry book (pp. 175-76).

Rommetveit (1968) also pointed out that contextual redundancy tends to serve as an important aid to meaning. For example, in the sentence, "The leader of the soldiers had really shown that he was a man," it seems unlikely that the reader will need to consider the maleness feature of the man because of the preceding information about soldiers. Another example of pro-active modification of meaning patterns cited by Rommetveit was that, in the expression "to sail a craft", the word "craft" is restricted as a water vehicle by the preceding word "sail" (p. 176). It is also possible that, if the word "craft" was unfamiliar, the reader would be aided in "guessing" what the meaning was in relation to other words in the context.

The processing of word meaning in context may also be postponed by the lack of sufficient information in the immediate context (Rommetveit, 1968, p. 177). Homonymous and polysemous word forms appearing near the beginning of a sentence, for example, might restrict the decoding process until sufficient information has been accumulated. Such a possibility was considered in the construction of test items. For example, in the sentence, "A bat can fly safely in pitch ZOVEDER, even when there isn't the faintest glimmer of light", there was a possibility that the processing of the word ZOVEDER might be delayed until the end of the sentence for a number of reasons, one being the uncertainty of the meaning of the word "bat"; another was that "fly" and "pitch" also have more than one meaning. Opportunities to examine the possible influences of proactive and retroactive modification in meaning patterns were created in the study by placing the unknown word in the test items in one of three positions -- near the beginning, near the middle, and near the end of sentences.

Ogden (1957) suggested that individuals attach meaning to other signs by way of association. The child, for example, may never have seen more than a picture of a zebra, or he might only have been told about one, yet he recognizes the real zebra when he sees one in the zoo. Similarly, although the child may never before have had direct experience with the unfamiliar word in the context, he may be able to determine its meaning. By attaching meaning to the words representing words already familiar, relating them to each other and to the "new" word, it might then be possible for the child to "guess" the relationship of the "new" or unfamiliar word to the rest of the context. As a result, it may be said that the child has acquired the meaning of or "knows" the unfamiliar word in so far as it now "makes sense" in that particular context.

The meaning attached to the unfamiliar word may also reflect the emotional or affective associations called to mind by the context or the signs. For example, if the word or sign was "spider," one individual might react with a distinctive associative response of fear. On the other hand, another individual might think of fun in the attic or chasing someone with a spider to note his expression of fear. To change the meaning of the sign "spider", according to Osgood (1967), it would be necessary to change behavior with respect to the sign. Since this study was not longitudinal, it was not possible to examine the concept of change in meaning over time. However, several test items presented to the subjects provided an opportunity for responses to reflect individual associations with the context from which the meaning of the unknown word was sought by subjects varying in age and/or stage of development.

In summary, a word is not an entity with a meaning. Words serve as stimuli to call up a category of meanings with the reader responsible for determining the meaning that fits best into the total context. If the reader's interpretation is adequate for the particular context required, he is generally considered to "know" the word. Knowing, however, is a relative term when applied to vocabulary because the individual may be able to "read" in the sense of pronouncing the word acceptably (recognition) and/or he may be able to understand the meaning of a word as used in a particular context. How much "knowing" comes from using the context to derive the meaning of an unfamiliar word tends to be relatively unknown.

Word Meaning in Relation to Concept Attainment

A word may represent a concept but a word is not a concept (Vinacke, 1952, p. 100). According to Russell (1956), a word is but a label which aids in the development of internalized ideas or concepts (p. 325). While Britton (1970) might agree with the first statement, he would not agree with the second. For him a word is not a label but represents categories of meaning, the scope and richness of which depends upon the internalized filing system of the individual (p. 196). By combining both ideas, it might be claimed that underlying the meaning of a word used in a particular context is the process by which the individual develops internalized ideas or concepts and expresses them through language (i.e. words and sentences). As the ability to generalize, abstract, and discriminate develops, the young reader is able to select a specific meaning required by the context, providing he brings to the situation considerable depth of understanding concerning that particular word (Russell, 1954, p. 332).

The development of true concepts appears gradually, the outgrowth of analysis (taking apart) and synthesis (uniting) of ideas (Vygotsky, 1962, p. 76). The young child moves from viewing an unorganized "heap" of objects to organizing an undifferentiated whole. Eventually he learns to think in complexes in that he can now make generalizations based on associations, but not yet on real understanding. When (and if) true concepts evolve in the final phase, usually in early adolescence, the individual is able to think abstractly, relating and synthesizing ideas no longer rooted in the actual. For example, Werner & Kaplan (1950) reported that young children (ages 9 to 10 years) had difficulty abstracting the meaning of a word from the whole sentence. With increasing age, however, the children were able to discriminate between the word and its meaning in one context as opposed to the same word with a different meaning in each of five additional contexts. It appeared that the strategies required to attain the concept, as demonstrated by increasing skill to acquire several meanings for a word, were becoming a part of a co-ordinated system, the third and final phase of concept attainment, the evolvement of true concepts. Vygotsky (1962) concluded that the word is important, serving as a guiding function in the formation of genuine concepts; that is, thought processes and language processes tend to be closely interwoven.

Piaget also stressed periods or stages of cognitive development. Each stage included a period of formation and a period of attainment, characterized by progressive structural organization of mental operations. Attainment at one stage led to the succeeding level so that children of varying ages might be at one stage, depending on factors such as experiential background, motivation, and the like (Inhelder, 1962, p. 23). Therefore, readers between the ages of nine to fourteen years might be functioning cognitively at the concrete level of operation (i.e. able to think logically, note differences, and seek relationships), when required to deal with abstract symbols representing concrete ideas. For some reading tasks, however, representing more abstract ideas, these same children might also be able to cope with abstract propositions, representative of Piaget's final period of formal operations (and not unlike Vygotsky's third phase). In a reading situation, it seemed highly probable that the proficient reader would obtain word meaning from the context by assimilating the information available in the surrounding context in order to accommodate the unknown word into his own structure of knowledge.

Bruner (1962) considered that the patterns or strategies used by learners to attain new concepts were important. As a first step, the learner must determine the nature of the task in order to focus attention on it. Next, decisions are made concerning how best to attain information effectively through selective cues in relation to the difficulty of the task, followed by additional decision-making (testing, accepting, rejecting) until the concept is attained with maximum efficiency and minimum strain (i.e. few wrong categorizations or cues). That the proficient maturing reader, striving to obtain the meaning of an unknown word in context, used strategies appropriate to solving the given task was considered a possibility.

The Role of Language and Experience in Concept Development

One way of representing experience, either past or present, is through language. The child's language reflects not only the ways in which he is experiencing the world but determines also how he operates in it. According to Britton (1970), from the language and thinking strategies available, the child is able to categorize and abstract ideas from his environment, having a repertoire of words for combining these ideas. The resulting language power is dependent on the level of his cognitive and language skills; that is, it is dependent on the child's interrelated language and thinking strategies (p. 21). Moreover, what is stored in consciousness (experiences) can be updated through reorganization of existing symbolic categories, resulting in the continuous broadening and deepening of concepts, newly acquired or stored (Britton, 1970, p. 19). Therefore, language is not only an external verbalization about things; it is also an "integral part of the personal process of experiencing and knowing (Smith, Goodman & Meredith, 1970, p. 68)." Through words and sentences the individual is able to "fixate, isolate, and relate aspects of his environment that would otherwise be a confused complex (Thomson, 1959, p. 176)."

If words and thoughts are so closely interwoven, it was considered likely that the verbal responses of proficient maturing readers, in explaining how they obtained word meaning from context, might reveal the level of language and cognitive skills used for that purpose. Loban (1963) reported that the high groups in his study of the language of elementary school children were the most fluent, the most able to control their language, and the most able readers (pp. 82-83).

Experiences then, are transformed into concepts and relayed by means of language. Hence, the meaning attached to a particular word depends upon individual experiences with the word. In reading, the more experience and knowledge that the individual can bring to the reading situation, the greater are the possibilities for broader and deeper understanding. In particular, when reading to obtain the meaning of an unknown word in context, the proficient reader who brings to the reading task a broad background of experience and knowledge, should be prepared for the "prospect" and "retrospect" suggested by Britton (1970, p. 19). However, there may be times when even the proficient maturing reader relies heavily upon retrospect in the form of using previous personal experiences to explain or identify an immediate situation or idea which he is unable to transform completely from the subjective (actual) to the objective. That is, egocentrism may not have faded entirely; instead, it may have become only partially internalized (Vygotsky, 1962, p. 20).

While it was anticipated that proficient maturing readers might process the context to obtain the meaning of an unknown word within the confines of the theoretical framework herein provided, reading research to support the ideas was limited. That developing readers were capable of selecting, testing, and organizing relevant ideas provided by the context in order to complete the context with a well-controlled idea (i.e. a precise, mature word) seemed probable in view of what has been stated concerning language-thinking power.

The Role of Context in the Reading Process

It has long been contended that reading is a highly complex thinking process (Thorndike, 1917; Gray, 1940; Russell, 1956; Stauffer, 1969). Thorndike provided some evidence that reading comprehension requires reasoning as determined by pupils' verbal responses to questions based on interpretation of paragraphs read. He reported that the good readers, in solving reading problems, attached meaning to each word encountered, selected certain elements in the context, determined the relationships between these elements or cues by weighing each properly in order to organize essential ideas and make possible understanding of the sentences and/or paragraphs. Inability of some readers to treat their responses as provisional and to test them further by "thinking out their subtle or more remote implications," was cited as one of the major weaknesses of their responses (Thorndike, 1917, p. 330).

Thorndike emphasized the need for careful, thoughtful processing of the context. He pointed out that the fluent reader, presumed to be the reader able to "read" or recognize the words in the written message, might not fully understand the passage unless he became actively involved in "what the book says." Active involvement was related to the ability to make judgments based on "elaborate and inventive organization and control of mental connections (Thorndike, 1917, p. 332)." It might be inferred that Thorndike considered that the degree of control of these "mental connections" was reflected in subjects' use of language; that is, by way of their verbal responses.

Gray (1940) was among the first to state that language and thinking are intimately related in the reading process. Stauffer (1969) considered three aspects of the reading-thinking process; namely, (1) declaring the purpose (i.e. ability to focus upon the specific reading task; (2) reasoning, consisting of a balancing of what was found against purposes, experiences, and language facility; and (3) making judgments, the productive task of making decisions which are pertinent and discriminate (p. 27). These ideas seemed closely related to Thomson's (1959) explanation of reasoning. He stated that reasoning consisted of reflecting about a happening in the light of past experiences, deliberating about an idea in view of the known or given, pondering over several solutions, hypothesizing possibilities, and checking over alternatives before judgments were made (pp. 13-14). It seemed logical that proficient maturing readers, attempting to derive the meaning of an unknown word from verbal context, might approach the task in a similar manner. How these judgments might be made was unknown.

Goodman (1973) defined reading as a psycholinguistic process by which the reader, a language user, reconstructs the writer's message encoded as a "graphic display (p. 22)." Goodman viewed reading as a receptive process in which the reader uses three cue systems simultaneously and interdependently. He called one cue system the graphophonic by which the reader responds to the graphic sequences in the context; a second one, the syntactic, consisting of pattern markers, such as function words and inflectional suffixes which aid the reader to recognize and predict structures; and the third cue system, the semantic, by which the reader derives meaning in order to "make sense" out of the context (p. 28).

According to Goodman (1973), proficient readers are able to select the most productive cues, test them against the semantic context in order to confirm or reject the meaning obtained. If errors are made, the proficient reader is able to gather more cues as needed. Besides, Goodman suggested that the strategies used to process literary type material might differ from the process used in discursive language.

Although Goodman's (1973) theory of the reading process tended to be more specific than the explanations given by Thorndike (1917), Gray (1940), or Stauffer (1969), strategies for problem-solving seemed to pervade them all. Whether these same strategies might be employed by proficient maturing readers to derive the meaning of an unknown word in context was a question raised at the outset of this study. Russell (1956) suggested that problem-solving ability increased with age in terms of speed and accuracy. Problem-solving ability seemed not to change with age but older children, having more experience to bring to the reading situation, were often more sensitive to a problem (p. 279). It appeared that this might also be true with respect to the ability of proficient maturing readers, at different stages of development, to process the meaning of an unknown word from context.

The Nature of Contextual Clues

Artley (1943) was concerned with the nature of the clues furnished by the context. He stated:

> . . .context clues refer to what might commonly be called "hints" that lie within a sentence, which are used as a means of aiding the child in recognizing the meaning of a new or unfamiliar word (p. 68).

These hints were considered more than just the words surrounding the unknown word. They were experiential as well as verbal, residing in the past experiences of both reader and writer (Artley, 1943, p. 73). Moreover, good readers should be able, in their everyday reading, to interpret not only the sense-meaning of the passage but also the intended meaning -- the mood, tone, or intent -- of the writer, if full understanding was to be achieved. Artley also contended that what the sentences meant depended upon the relationship, the interplay, between the reader and writer, resulting only when full use was made (automatically) of the clues offered by the context.

To support this idea, Artley (1943) developed ten major categories with twenty-one subheadings to serve as an a priori classification scheme for contextual clues. The main arbitrary groupings included typographical aids, structural aids, substitute words, word elements, figures of speech, pictorial representation, inference, direct explanation, and subjective clues. The purpose of the scheme was to organize context in such a way that it might be presented systematically to the child.

McCullough (1943) published a classification scheme, consisting of seven categories: namely, definition, experience, comparison or contrast, synonym, familiar expression or language experience, summary, and reflection of a mood or situation. Explanation of the aids and suggestions for teaching th[illegible]ere clearly outlined. McCullough (1943) attempted to jus[illegible]r categories on the basis of two unpublished studies, her [illegible]nd one by Strang, both involving the responses of college students requiring the use of specific contextual cues to determine the meaning of an unknown word in context.

Referring to her own study, McCullough (1967) admitted that only "the top of the iceberg" was seen because "nine-tenths of the signals suggestive of meaning were hidden by our ignorance of other supportive linguistic cues (p. 361)." Nevertheless, for almost a quarter of a century a priori classification schemes served as the theoretical framework for the majority of research studies completed in relation to use of context as an aid to meaning.

Deighton (1959) scrutinized a sample of 500,000 running words for the purpose of finding examples of contextual clues. Deighton concluded that the context revealed infrequently the meaning of unfamiliar words, that the building of meaning from context was a gradual process, and that possibilities for its effective use depended on the previous experience of the reader, on the proximity of the unfamiliar word to the enlightening context, and the clearness of the connection between the context and the unfamiliar word (p. 6).

Ames (1965) provided the first empirical evidence that mature readers used the context to obtain word meaning. On the basis of their verbal responses Ames developed a fourteen-category classification scheme of contextual clues reportedly used by these mature readers.

Dulin (1968) helped clarify long-standing assumptions concerning the existence of at least five classes or types of contextual aids. On examination of the existing classification schemes for contextual clues, Dulin found that only five types of these clues appeared consistently in all the schemes. He considered the following types of contextual clues generic: (a) contrast, (b) linked synonym and/or appositives, (c) direct description, (d) language experience, and (e) cause-effect relationships. The five types of contextual clues were embedded in a five-form test and the test was administered to 315 grade ten students. On the basis of test results, Dulin (1968) concluded that the five types of contextual clues "did in fact exist."

Research Studies Related to Use of Context in Reading

One of the major concerns in this study was to determine how developing readers processed the context to obtain the meaning of an unknown word. Although few studies were found which addressed themselves to the subject of process, findings from several studies offered direction.

Factors which might affect use of context

Eckert (1936) reported that the interpretation of meaning from context was a matter of judgment and reasoning, performed more efficiently by brighter children than by others. She suggested that the problem of deriving word meaning from context was complex. The degree of success achieved by young readers tended to be affected by the nature of the context and by the modifying effect of contiguous words and phrases.

Looby (1939) reported that the ability of grade 6 pupils to use the context was influenced by their mental ability and their environment. She concluded that grade 6 pupils seemed to attempt to obtain word meaning but their efforts were not always successful. The two research studies just cited reported the relationships between ability to obtain word meaning from context and intelligence or reasoning but made no attempt to determine how these more able readers reasoned to obtain word meaning from context.

Werner & Kaplan (1950) suggested that children between 8½ and 13½ years (the approximate ages of subjects in this study) acquired meaning principally in two ways: by explicit reference (e.g. parents' direct naming of object) and through implicit or contextual reference (i.e. meaning being inferred from cues of verbal context). The steady increase by age group in ability to obtain a single word to "fit" the six contextual situations for each set of test items, to integrate the cues from the contexts, and to approach the tasks objectively was significant. The immature language behavior of the younger subjects was revealed in two major forms. First, they were less able to differentiate between the meaning of a word and the given verbal context. For example, in the sentence "People talk about the BORDICKS (faults) of others and don't talk about themselves," the response "Well, bordick means 'people talk about others and don't talk about themselves' that's what bordick means (Werner & Kaplan, 1950, p. 15)." Secondly, in the younger subjects' responses holophrastic characteristics were apparent in that sentences tended to be conceived as "undifferentiated wholes rather than as constructs of discrete units (p. 22)." The concept was not confined to the unknown word but, in attempting to transfer its meaning to another situation, part or all of the former context was included in the explanation. For example, the elicited response of one subject, for "ONTRAVE (hope) sometimes keeps us from being unhappy" was want, reference being made to a broad contextual situation: "If you want a bow and arrow and you get it, that keeps you from being unhappy." Other subjects tended to transfer parts of previous sentences in the series to explain the meaning of the response given in the next situation. For example, the response,"'To get a good mark' keeps us from being unhappy" seemed to have been transferred from the explanation given previously for ONTRAVE -- "If you get a good mark you must also work hard for it."

Findings in the Werner & Kaplan study (1950) suggested that precision in the signification process increased with age. It could also be inferred that elementary school children might process word meaning more efficiently if given a single sentence. Furthermore, young maturing readers might be able to process the meaning of an unknown word in the context of a paragraph, if the length of the paragraph was limited. Voice (1968), for example, presented grade 5 subjects with a passage of continuous prose from a basal reader and from which every nth was replaced by a simulated word. He concluded that the subjects were best able to obtain an appropriate meaning for the unknown word when the contextual clues were in the immediate sentence. On the whole, however, the subjects were not efficient in obtaining word meaning from the context (for only 17.5 per cent of the contextual situations). It appeared that the reading situations (even though representative of material read in school by grade 5 subjects) might not have allowed these young readers to use context effectively.

Research to support the concept that ability to obtain word meaning might be developmental is limited. Evidence that readers at different age levels were able to obtain word meaning from context (with varying degrees of success) seemed to be limited mainly to studies which concluded that certain contextual clues, embedded in the passages, were used since subjects completed the context with appropriate meanings (usually, single words). These studies, however, furnished information which seemed to suggest that young maturing readers might process word meaning from context differently, depending on the stage of development or the age of the learner. A review of the research relevant to the topic, how developing readers obtain word meaning from context, provided some guidance for the present study.

Ability of mature readers to use context

Gibbons (1940) reported that college students could not use the context more than 48 per cent of the time. Ames (1965) concluded that graduate students used the contextual clues embedded in certain passages with significant success 60 per cent of the time. Fletcher (1959) found significant correlation between the ability to use context and reading comprehension and between ability to use context and reading vocabulary. He concluded that the students who could derive meaning from context tended to have better vocabulary and slightly higher intelligence scores than those who lacked this ability.

Ability of maturing readers (high school) to use context

Findings related to use of context by high school students seemed to suggest a relationship between vocabulary level, reading comprehension, and intelligence factors (Stearns, 1954; Quealy, 1969). An interesting conclusion drawn by Stearns (1954), not found elsewhere, was that growth in ability to use context seemed to occur between grades nine and eleven. Quealy(1969) found no significant advancement in ability to use context between grades ten to twelve. Spache and Berg (1955) reported that the average high school student could derive meaning 50 per cent to 60 per cent of the time. There was no significant growth in the use of contextual clues during the high school years.

Ability of young maturing readers to use context

Findings in relation to the usefulness of context as an aid to obtaining word meaning by elementary school children tended to vary. Elivian (1938) placed seventy-three words from the Thorndike and the Buckingham-Dolch word lists into stories wherein four types of contextual devices (definition, synonym, repeated usage, inference) were embedded. He concluded that ability to derive word meaning from context was related to reading ability and to grade level, increasing from grades four through eight. Elivian (1938) and McKee (1948) reported that grade four subjects were able to obtain an appropriate word meaning from context for approximately one-third of the test items. McCullough (1945) concluded that grade three pupils were "guessing blind" when results yielded an average success of about 40 per cent. The percentages of correct responses varied from a low of 32 per cent for experience to a high of 46 per cent for definition.

On the basis of responses to the *Context Test* in which thirteen out of the fourteen types of contextual clues used by Ames (1965) were embedded, Rankin & Overholser (1969) calculated that the average proportion of correct answers was: grade four, 43 per cent; grade five, 50 per cent; and grade six, 63 per cent. Conclusions drawn were that intermediate grade children were able to respond adequately to certain types of contextual clues and not to others. Accuracy for different clues ranged from 26 per cent to 60 per cent. Furthermore, Rankin & Overholser (1969) reported that the rank order of difficulty among the thirteen types of contextual clues was highly consistent among grade levels and reading levels (designated as high, medium, and low) within grade levels.

Findings, based on varying purposes for each study reported, tended to be too diffuse to make comparisons possible. That subjects seemed to vary in their ability to use the context was apparent. Only Rankin & Overholser suggested that the efforts of the intermediate grade children in their study were adequate--in the use of some types of contextual clues, at least. On the other hand, suggestions that improvement in teaching methods might serve to increase efficiency in the use of context to obtain word meaning by elementary school children seemed premature in view of the limited knowledge revealed by the studies concerning how the context was being used or why young maturing readers failed to make efficient use of it. For possible guidance in that direction, studies concerned with teaching children to use the context were examined.

Instruction in the use of context clues

Butler (1943) reported no significant difference between experimental and control groups in grades 5 and 6, following a period of instruction in the use of context by the experimental group. She suggested, however, that specific instruction in teaching pupils to use context might be beneficial. Hafner (1965) spent one month (12 lessons) teaching one fifth grade class to use contextual aids. He reported no significant gains over two control groups not taught by him, but concluded that the teaching of context aids was important in spite of non-significant findings. A one-month training period was considered inadequate.

By contrast, Peterson (1942) reported significant gains following a ten-week instructional period with junior high students. She concluded that directly attacking the problem rather than relying on incidental methods or wide reading yielded the greatest improvement in reading as measured by ability to use the context. Likewise, Guarnino (1959) limited his study to lessons taught to three English classes for one month and later, to twelve English classes (grade 10) for the same period of time. The most significant gains were made by pupils having low context scores and high reading comprehension pretest scores.

Within the limitations of the results obtained from reported research, it appears that ability to derive word meaning from context may be developmental. How that ability functions in maturing readers was not revealed by the reported research. Mature readers in the Ames' (1965) study revealed how they obtained meaning from context by way of fourteen types of contextual clues identified from their explanations. Using a similar approach, it might be possible to explore the processes used by young maturing readers to derive word meaning from context.

Use of context to obtain meaning of an unfamiliar word

In the majority of research studies related to use of context to obtain word meaning it appeared that the word required to replace the simulated word or blank space was unknown in that it was missing from the context. Whether the meaning of the deleted word was, in fact, unfamiliar to the reader was not established. As a result, the issue of how word meaning is obtained from context seems to have been confounded by this tendency to equate the terms "unknown" and "unfamiliar" with respect to use of context to derive word meaning.

Olson (1972) attempted to establish that the simulated words placed in the context of a Vocabulary-Context Aids Test were unfamiliar through use of a pretest. Words selected from the

Reader's Digest, Reading Skill Builder, Book Six, were presented in isolation to ninety students. From the list, twenty-five words missed by 50 per cent of the students in the screening test were embedded in the experimental test which consisted of two selected readings (Reader's Digest, Reading Skill Builder, Book Six).

Ten students from the group who missed 50 per cent or more of the words in the screening test became one-third of the experimental sample. Whether all the twenty-five words were unfamiliar to the ten subjects chosen was not stated in the report. It appeared also that it was assumed that the words were unfamiliar to the remaining twenty subjects. Furthermore, no indication was given concerning the time lapse between the screening test and the experimental test.

Olson (1972) reported that all subjects correctly identified the meanings of at least 48 per cent of the words in context and 13.3 per cent of the subjects identified 75 per cent or more word meanings. Moreover, subjects used the clues expected of them (i.e. in relation to the six types of embedded contextual clues) 32 per cent of the time. No account of what additional cues the subjects used to obtain word meaning was given.

The Olson (1972) study was significant in that it attempted to determine how successfully grade 6 subjects used the context to obtain the meaning of an unfamiliar word. Furthermore, it pointed up the need for research in at least two areas. First, it is not known whether the meaning of a familiar word replaced in the context by a simulated word or a blank is processed in the same way(s) as is the meaning of an unfamiliar word in the context. Secondly, a reliable means of determining whether the word in context for which the reader seeks meaning is, in fact, unfamiliar to him, is needed.

Use of context in relation to grammatical class

Recent research tends to support the idea that the grammatical form of words imposes constraints upon the use of context in reading. The processing of word meaning may be facilitated by reducing word membership to a particular word form class.

Ames (1965) reported significant relationships between syntactic cues and word meaning. Simulated words, representing four word form classes, yielded the following percentages of success: verbs, 69 per cent; adverbs, 67 per cent; nouns, 60 per cent; adjectives, 48 per cent. Ames concluded that knowledge of syntax seemed to affect word meaning.

When Dulin (1968) considered word form class generally, no significant differences were revealed in grade ten subjects' use of one word form class over another. An easy to hard hierarchy was determined -- nouns, adverbs, adjectives, and verbs, respectively -- that differed from Ames' (1965) findings. Louthan (1965) reported that, at the grade seven level, correct responses to noun and verb classes, deleted from the context, were significantly lower than all other grammatical classes. On the basis of results from standardized reading tests, Bhooma (1969) concluded that, for grade six subjects, the deletion of nouns produced a significant decrease in performance scores. While no conclusions can be drawn on the basis of these studies, the variance in findings seemed to suggest that, although syntax may place constraints on the context, additional factors tend to influence the reader's use of context to obtain word meaning.

Concerning the purpose of function words, Conlin (1961) pointed out that, although function words "are more significant for what they do than for what they mean," they perform important grammatical functions in subordination and coordination of ideas (p. 140). By contrast, Katz & Brent (1968) concluded, on the basis of their findings, that "the meaning of connectives play a far more significant role than their grammatical structure as far as English is concerned (p. 504)." In general, Katz & Brent reported a clear developmental trend in the linguistic control of selected connectives on the basis of explanations given concerning the use of certain connectives by subjects in grades one and six and college level. College students, for example, preferred "when" to "then" while grade one subjects tended not to behave differently with either "when" or "then". They also observed a clear developmental trend in the understanding of adversative relationships, such as "but" and "although". With increasing age, subjects tended to prefer temporal linkages to causal connectives ("when" to "because", for example). To what extent readers, at different ages, understand the relevance of similar connectives to deriving meaning from the context was investigated by Robertson (1966). She concluded that grade level was a factor in children's understanding of connectives in reading. The level of understanding in grade four was 57.29 per cent; in grade five, 65.99 per cent; and in grade six, 74.72 per cent. Although the study was concerned with the extent connectives were used rather than why certain connectives were chosen over others in completing cloze test items, it might be assumed that the context surrounding the connectives served as an aid to determining the connective required to complete the context. That subjects processing word meaning from context might report specific use of connectives located in the experimental data-gathering instrument was considered a possibility.

Studies of the Reading Process Using Introspective Techniques

Introspective techniques were used by Ames (1965) in his study of how mature readers obtained the meaning of an unknown word from context. Following the reading of passages from which every fiftieth word was replaced by a simulated word to provide 556 different contextual situations, readers explained how they used the context to obtain the unknown word. Subjects' responses were classified in terms of the types of contextual clues indicated by subjects as having helped them get meaning from the context. It was assumed by Ames (1965) that reasoning was used by the subjects for the purpose of obtaining word meaning.

At least two possibilities relevant to the present study were projected by the Ames' study. First, consideration was given as to whether a similar approach might be used to determine how young maturing readers obtained word meaning from context. Secondly, there was the possibility that more valid information might be obtained if the subjects were not given specific instructions to use the context. Instead, subjects could be asked to decide upon a word of "best fit" to complete the meaning of the context before being induced to explain why they used a particular word to replace the deleted word. However, before the decision to use this approach was made, additional research studies employing introspective-retrospective techniques were reviewed.

Strang (1967), concerned with gaining insight into the reading process, wrote in support of the introspective approach, as follows:

> Insights into the reading process thus gained introspectively may confirm, modify, or revolutionize methods of testing and teaching reading (p. 21).

Relating her own point of view to that of I. A. Richards' concerning the best way to understand the reading process, Strang (1967) further expanded her ideas about the process when she wrote:

> If we could see the pupil's mind from the inside at the moment of understanding the meaning of the selection he is reading, we would know more precisely how he comprehends and interprets what he reads. Persons of different ages and abilities, with encouragement and practice, are able to recall and verbalize thoughts and feelings that occur to them as they read: in other words, they can describe their own learning experiences. . . . These introspective-retrospective reports give the closest available description of the reading process (p. 19).

Huey (1908) introduced the idea of an introspective approach in reading when he asked individuals to report on the associations which came to mind as they read, confessing that the test, though still imperfect, was "probably the sanest available (p. 150)." Sane though the approach may have seemed, it tended to fall into disrepute for a period of time, probably because some research studies naively assumed that mental processes could be described directly from verbal utterances instead of accepting that human consciousness in an inferred construct (Boring, 1953). For example, Pickford (1935) asked adults well known to him, to read aloud prose and poetry and react during and immediately following the reading. In his report of the study, Pickford stressed that his success was "dependent on the subject's use of words to reveal the mental processes being studied (p. 35)."

During the 1950's, when attention was once more focussed upon the need to understand the process of learning, renewed interest in the introspective approach as a means of gaining information concerning the reading process was apparent. At the University of Chicago, Swain (1953), Piekarz (1954), Jenkinson (1957), and Letton (1958) used introspective-retrospective verbalizations to study the reading process, following similar plans for interviewing, but each developing somewhat different approaches to the reading tasks and to analysis of the data. Swain (1953) induced good, average, and poor high school readers (all above average in intelligence) to "think aloud" while reading a carefully structured problem-oriented reading test. Subjects were considered naive to what was being observed but the purpose of the reading task was made clear. Responses were recorded and transcribed in order that they might be categorized along three postulated dimensions from which generalizations concerning the reading process were made. The main shortcoming of the Swain study (1953), like the Piekarz (1954) study which followed, was its reliance, in analyzing the data, upon a traditional framework, postulated in advance and based on reading experts' opinions and research.

Piekarz' (1954) study, however, served as a valuable guide for the present study in that grade six children, considered naive concerning the psychological nature of reading, revealed that they were capable of introspection and opened the way for further research relative to the reading process. In a less structured situation than was used by Swain (1953), Piekarz (1954) observed grade six subjects who were induced to recall and verbalize thoughts and feelings that occurred while they were reading. In addition, they were asked questions following the reading of each passage. Of particular interest were two findings; first, that grade six subjects verbalized more about short units than about long ones, tending to become confused and discouraged by trying to remember too many ideas at one time and secondly, the subjects seemed to combine a background knowledge of words with clues from the text to define word meanings, searching the immediate context for clues to antecedents and references. In addition, selection of the population sample was carefully planned. All subjects were above grade level in vocabulary achievement but different in ability to interpret continuous meaningful context (i.e. comprehension scores differed).

In a study involving grade ten subjects, Jenkinson (1957) examined reading comprehension from the standpoint of process, product, and the interrelationships between process and product. Using retrospective techniques which did not interfere with the reading process in the way that "thinking aloud" while reading might have done, Jenkinson (1957) asked selected subjects to recall why they selected cloze responses to a comprehension test previously completed. The data were allowed to determine the criteria best suited to classify and describe the reading processes used by the subjects to complete the meaning of the reading passages. While the study was not designed specifically to determine how word meaning was obtained from context, findings revealed that the proficient readers in describing how they completed the cloze passages, tended to use the context to explain certain unfamiliar words or expressions. In analyzing the data, paucity of vocabulary was derived as one criterion for identifying the reader less able to obtain meaning from the reading passages. By allowing the data to determine what the reading process might be, Jenkinson's study revealed that, according to grade ten subjects' responses, in retrospect, the reading process was, for them, both a thinking process and a language process.

Werner & Kaplan (1950) asked children between the ages of 8-6 and 13-5 years to verbalize how they acquired word meaning from context. Subjects were required to determine the meaning of an artificial word embedded in six separate sentences. As the child (individually tested) finished reading the sentence he was asked "in what way and why the meaning given fit the sentence (Werner & Kaplan, 1950, p. 7)." From the protocols obtained from subjects' recorded responses, three judges derived sixty criteria to make possible a qualitative and quantitative analysis of the subjects' language behavior. It appeared that the verbalized responses of young subjects provided valuable and valid information concerning changes in language processing to obtain word meanings from verbal context by children, ranging in age from approximately 9 to 14 years. From the examples provided in the Werner & Kaplan report (1950), there appeared to be some evidence that background knowledge and thinking power may have contributed considerably to the reading process of acquiring word meanings from the given contexts.

Research Relevant to Introspective Studies in Reading

One of the most frequent and most successful user of introspective techniques with naive young subjects was Piaget. Piaget, like Rousseau, did not consider the child a miniature adult whose thought processes were the same. Moreover, he did not consider that the child's thought processes were less efficient than the adult's; they were simply different (Piaget, 1928, p. 199). Using a free and unstructured approach, Piaget observed children, talked with them, and listened to them over a long period of time before advancing his theories of intelligence (Ginsberg & Opper, 1969, p. 5).

To learn how a child reasoned, for example, Piaget observed him facing a specific problem requiring a solution. The child was not expected to give "an account of the psychological how of the process" but rather to "limit himself to an account of what he had done" or to "give his logical reasons for solving the problem that way (Piaget, 1928, pp. 138-39)." The procedures used were simple. To learn how a child solved a mathematical problem, for example, he was presented with a simple problem. After the answer was given, a simple question, such as "How did you find that out?" or "What did you think so as to find that out?" was posed (Piaget, 1928, p. 137). On the basis of Piaget's wide experience with children's reports of their thinking, it seemed reasonable to consider that the responses obtained from maturing readers concerning how they obtained word meaning from context could also provide valid information relative to the reading process.

Piaget believed that the child at age seven or eight, becoming more conscious of thought, is capable of reflecting upon his own thinking. He considered introspection a "thinking about thinking" done by the child to justify his own judgments and not to be confused with the original spontaneous thoughts (Piaget, 1928, p. 144). According to Piaget, even adults are incapable, either by introspection or retrospection, of recapturing "the successive steps our mind has taken." He viewed an accurate retrospection as a reflection upon the whole course of reasoning. Younger children, Piaget contended, were less able to order their thoughts, taking as a starting point what was their final goal; that is, they tended to start with the results, reconstructing how they began. Older children (from approximately nine years upward) were able to explain what they were looking for and what they did to find the answer (Piaget, 1928, p. 141).

Bloom & Broder (1950) admitted that subjects might order their thoughts while verbalizing how they solved problems, resulting in an inaccurate representation of the actual thinking processes. Nevertheless, they provided college subjects with test-type material to create a classroom problem solving mental set while problems were being solved. Verbal responses were recorded and analyzed. With younger subjects it was also considered important to create a suitable mental set for solving the reading problems in the form of test-type materials presented in such a way that fears frequently attached to testing situations were removed.

Peel (1971) cited the need to explore possible developments and differences in meaning which emerge from "practice in language and from thinking associated with it" during and after adolescence. For this purpose he suggested a simple research technique. The subject was provided with a verbal situation, fairly unrestricted, to allow him to reveal his meanings, to construct his ideas, and to make his judgments. In support of the approach, Peel (1971) stated that, although qualitative judgments by judges were necessary, "the gain in more revealing replies is most valuable for it takes account of the structural quality of the language-thought process (p. 159)."

A specific example of such an approach was provided by Peel (1971). He reported that De Silva (1969) used this introspective technique to examine how subjects (ages 12 to 16 years) constructed the meaning of a single history concept word (replaced by a simulated word) in context. After being asked to give the meaning of the unknown word, the subject was asked, "Why do you think so?"

Responses were categorized into four classes from least to most mature. Results revealed that use of the whole logical structure of the passage to obtain word meaning from context increased with age. These findings suggested that classification of responses in linguistic terms should provide useful information concerning the reading for meaning process of children ranging in age from nine to fourteen years.

Fox (1969) reminded those contemplating use of either the case study or retrospective approach that much about processes in the abstract may be learned, providing a wide variety of data is compiled over time. He concluded by stating that retrospection is a "picture of the past as people remember it and are willing to report. . . . It may actually reflect the way it really was. But to some extent it almost certainly will not (p. 433)."

While the studies reviewed, together with the comments from experts in this area, pointed out the difficulties and complexities of analyzing and reporting findings concerning the reading-thinking processes, at the same time, they seemed to suggest that process data of a retrospective type would be most likely to provide valid information concerning how developing readers obtain the meaning of an unknown word from context.

Summary: Focus of the Study

Reading to obtain word meaning from context is an important facet of the reading process about which little is known. It appears to be an internalized language-thinking process which makes objective examination of how the reading-meaning process operates a difficult task.

Reading involves the use of language, those abstract symbols which must be recognized and interpreted in relation to the surrounding context. Successful understanding or comprehension may depend upon the ability of the individual to adapt or adjust already existing language-thinking processes to the particular task of deriving word meaning from context. It seems probable that the proficient reader uses the linguistic information provided by the context to trigger the language-thinking processes required to identify the word and its meaning. That this ability to obtain word meaning is dependent upon other factors, such as the scope and richness of the reader's experiential background and knowledge, the mental "set" or purpose established for the task, and the strategies acquired for undertaking and completing the task, seems equally possible.

While the efficiency level for processing word meaning successfully may be developmental, young readers, users of language and capable of thinking and reasoning, may also process the context to obtain word meaning with efficiency befitting their stage or level of development. Before such judgments can be made concerning the competency of developing readers to obtain word meaning from context, it is necessary to gain information relative to how word meaning is processed at different ages or stages of development. Within the conceptual framework described in this chapter, developed from recent and not so recent theories, expert opinions, and limited research, this study was organized and conducted as described in the chapters which follow.

The study was focussed upon the verbalized responses of developing readers to reading tasks for which the meaning of an unknown word was sought from the context. By examining the product (the elicited word meaning obtained from the context) in relation to the subjects' verbalized explanations of how word meaning was obtained (the process), information concerning the reading for meaning process was anticipated. No predetermined criteria were developed for the analysis of the data. Nevertheless, information gained from the literature served to help focus attention on available evidence provided by the data. At the same time, the way was left open for gaining additional information from the data, not previously anticipated. It was hoped that subjects' verbalized responses would reveal not only how efficiently they processed the context to obtain the intended meaning of the unknown word but also what helped them attain the meaning and how much meaning was obtained (i.e. in terms of acceptable and unacceptable word meanings declared meaningful by the subject).

CHAPTER III

THE DESIGN OF THE EXPERIMENTAL STUDY

Use of retrospective techniques made possible an exploratory study of the processes used by very proficient, proficient, and less proficient readers in grades 4, 6, and 8 to obtain word meaning from context. During individual interviews, as each S reported how he used the context to complete the meaning of the reading tasks presented, the responses were recorded on a Sony-80 Cassette Recorder. As soon as possible after the conclusion of each interview, the S's recorded responses were transcribed by the investigator to typewritten protocols.

The purpose of this chapter is to discuss procedures for selection of the sample, collection of the experimental data, and treatment of the data. Descriptions of interviewing techniques and procedures are also included.

Selection of the Sample

Criteria for selection of the subjects

Since the major purpose of the study was to explore how word meaning was processed from the context by developing readers, proficient and potentially proficient readers at three grade levels were selected. It was considered probable that patterns of performance at different age or grade levels might be revealed. It was also considered important to gain information concerning how word meaning was processed by proficient readers at a particular age or grade level; that is, readers relatively free of factors which might interfere with the reading process. Therefore, the 54 Ss in the study were selected according to the following specifications:

1. At each grade level, grades 4, 6, and 8, 9 boys and 9 girls were chosen.

2. Each S was considered naive concerning the psychological nature of the reading process. It was assumed that, after being made acquainted with the purpose of the study, each S would respond in his usual sincere, child-like manner, to the questions posed during the interviews.

3. The mechanics of word recognition were mastered by each S to the degree that he was not inhibited by an inability to recognize the words while attempting to get meaning from the context. Hence, the vocabulary achievement of the Ss selected for the study was at grade level or better.

More specifically, the 54 Ss were selected on the basis of their performance on a screening test, the reading and vocabulary sections of the Canadian Tests of Basic Skills, administered by classroom teachers in September, 1971 and scored by computer services (approximately five months prior to this study). The selection of the sample was made as follows:

a) First, from the eight selected schools, (described in the next sections) lists were made of the names of pupils, at each grade level (grades 4, 6, and 8), whose reading scores on the designated screening test placed them in one of the three following categories:

i) Very proficient reader: A pupil whose vocabulary score and comprehension score were above the 85th percentile for the grade level.

ii) Proficient reader: A pupil whose vocabulary score and comprehension score were at grade level or higher but not beyond the 84th percentile.

iii) Less proficient reader: A pupil whose vocabulary score was at grade level or better but not beyond the 84th percentile; his comprehension score was lagging one year or more behind his vocabulary score.

b) Secondly, from the lists of names compiled for each grade, the names of 6 Ss (3 boys and 3 girls) were randomly drawn on the basis of each of the three categories listed above, making a total of eighteen Ss at each of the three grade levels (grades 4, 6, and 8).

4. No S was selected who had spent more than one year in any one grade.

5. Lastly, a S was eligible for the study if English was the first language spoken in the home. Since potentially proficient readers (Less Proficient reading group) were included in the study, possible second language interference in the process of obtaining word meaning was removed by placement of this limitation.

Selection of the sample

The fifty-four Ss interviewed in this study were selected from eight elementary public schools in Saskatoon, Saskatchewan. The selection of the eight schools (out of a possible forty-four elementary public schools) was made by the Director of Instruction for the Saskatoon Public School Board of Education. In making the selection, consideration was given to the availability of a quiet room for the individual interviews and to the size of the school population. In so far as it was possible, schools large in population and representing a wide range of reading ability were chosen for two reasons: (1) to reduce the amount of time spent in moving from school to school and (2) to make more time available for becoming familiar with the teachers and pupils in each school involved in the study.

In September, 1971, the total elementary school population in Saskatoon public schools was 15,097. During that same month, when the Canadian Tests of Basic Skills were administered, in the eight schools selected for the study, there were 464 pupils in grade 4, 469 pupils in grade 6, and 420 pupils in grade 8. The total number of pupils in grade 4 was 1,873; in grade 6 there were 1,763 pupils; and in grade 8 there were 1,787 pupils. Therefore, although the eight schools selected represented less than 20 per cent of the total number of elementary public schools, their population represented almost 40 per cent of the total population.

From the eight selected schools, the total number of pupils in grades 4, 6, and 8 whose reading scores made them eligible for the study is shown in Table 3.1. From this criterion population (123 pupils in grade 8; 127 pupils in grade 6; and 147 pupils in grade 4), eighteen Ss, representing 6 very proficient readers (Very Proficient reading group), 6 proficient readers (Proficient reading group); and 6 less proficient readers (Less Proficient reading group), were randomly drawn from each grade level (grades 4, 6, and 8).

Characteristics of the sample

The main characteristics of the fifty-four Ss in the study were as follows:

1. Reading ability. - The mean vocabulary and comprehension scores of the Ss were obtained from the reading subtests of the Canadian Tests of Basic Skills. These standardized reading tests were administered in September, 1971. Therefore, the minimum criterion vocabulary score was beginning grade level plus one month. For the Ss in this study the minimum criterion vocabulary scores were grade 4.1, grade 6.1, and grade 8.1 for grades 4, 6, and 8, respectively.

The vocabulary score of each S in the study was higher than the minimum criterion grade score requisite. As shown in Table 3.2, the lowest vocabulary grade score for grade 4 was grade 4.3; for grade 6, grade 6.2; and for grade 8, grade 8.3. Considering the criterion vocabulary score as indicative of reading potential, all Ss in the study were designated as potentially able readers.

With respect to the criterion comprehension scores of the

Table 3.1

Criterion Population From Which the Sample Was Drawn

Grade	No. Very Proficient Readers	No. Proficient Readers	No. Less Proficient Readers	Total No.
8	43	53	27	123
6	53	48	26	127
4	62	41	44	147

Table 3.2

Means and Range of Vocabulary and Comprehension Criterion Scores (C.T.B.S.) by Reading Group and by Grade

Grade	Reading Group	Vocabulary Grade Score Mean	Vocabulary Grade Score Range	Comprehension Grade Score Mean	Comprehension Grade Score Range
4	Very Proficient	6.18	5.5- 7.0	5.95	5.8- 6.1
	Proficient	4.92	4.7- 5.2	4.93	4.6- 5.1
	Less Proficient	5.25	4.3- 5.9	3.92	2.7- 4.7
6	Very Proficient	7.98	7.5- 9.1	7.98	7.7- 8.6
	Proficient	6.67	6.3- 7.0	6.65	6.3- 7.0
	Less Proficient	6.72	6.2- 7.2	5.26	4.2- 6.1
8	Very Proficient	9.98	9.5-10.4	10.23	9.7-10.6
	Proficient	8.80	8.3- 9.2	8.83	8.3- 9.3
	Less Proficient	8.86	8.6- 9.2	7.71	7.1- 8.2

Very Proficient and Proficient reading groups, the grade score of each S was higher than the criterion score required (grade level or above). The lowest criterion comprehension grade scores obtained by any S in the Very Proficient or Proficient reading groups were: for grade 4, grade 4.6; for grade 6, 6.3; and for grade 8, grade 8.3 (Table 3.2).

As anticipated, the mean comprehension scores of the Less Proficient reading groups varied considerably; for example, in the Less Proficient grade 4 reading group, the comprehension grade scores ranged from grade 2.7 to grade 4.7 with each score representing a discrepancy of one year or more in relation to the corresponding vocabulary score. In other words, not all comprehension scores of Ss in the Less Proficient reading groups were below grade level: they were, however, sufficiently low to place the Ss in the Less Proficient reading group. In the Less Proficient grade 4 reading group, for example, the highest grade score was 4.7 and in the Less Proficient grade 8 reading group the highest comprehension score was grade 8.2 (Table 3.[illegible]).

To make certain that the criterion for selection of the fifty-four Ss (the comprehension and vocabulary reading scores), arbitrarily determined by the investigator was, in fact, statistically significant, the reading scores were submitted to statistical treatment.

Results of the two-way analysis of variance revealed significant main effects on comprehension scores due to groups (F = 130.74; p = .00) and to grades (F = 358.04; p = .00). (Appendix

G) Scheffé tests revealed a significant difference between the mean scores of the Very Proficient and Proficient reading groups at the .001 level, in favor of the Very Proficient reading groups. A significance difference was also found between the mean comprehension scores of the Proficient and Less Proficient reading groups at the .001 level, in favor of the Proficient reading groups. Hence, in so far as reading comprehension scores were concerned, the three reading groups were significantly different across the grades. Similarly, significant differences in mean comprehension scores by grades were established. Scheffé tests revealed that the mean scores of the grade 8 Ss were significantly higher than the mean scores of grades 4 and 6 at the .001 level. The mean scores of the grade 6 Ss were significantly higher than the mean scores of the grade 4 Ss at the .001 level.

Main effects due to groups ($F = 43.55$; $p = .00$) and to grades ($F = 329.89$; $p = .00$) were revealed in mean vocabulary scores. (Appendix G) Scheffé tests revealed a significant difference between the mean scores of the Very Proficient and the Proficient reading groups and between the mean scores of the Very Proficient and Less Proficient reading groups, both in favor of the Very Proficient reading groups at the .001 level of significance. There was no significant difference between the mean scores of the Proficient and Less Proficient reading groups; that is, there was no significance difference between the two groups in reading potential as determined by their vocabulary scores.

2. Age levels.- The average chronological age by group and

by grade, shown in Table 3.3, was approximately the same within each grade level. Considering 6.0 years as the possible minimal age for beginning school, none of the Ss in the study exceeded the one year per grade limitation. The age of the oldest S in each grade was as follows: grade 4, 9.9 years; grade 6, 12.6 years; and grade 8, 13.9 years (Table 3.3).

3. Intelligence. - Intelligence was not a criterion for selection of the experimental sample. Nevertheless, IQ scores, obtained from the Ss cumulative records provided valuable information concerning the fifty-four Ss; therefore, the IQ scores were included in the description of the sample. The IQ scores, based on the Lorge-Thorndike Group Intelligence Tests administered yearly by classroom teachers to pupils in grades 4 and 8 in the school system from which the sample was drawn, were recently acquired for grade 4 Ss (February, 1972). The IQ scores for grade 8 Ss were based on IQ tests administered during Fall, 1971; the IQ scores for grade 6 Ss represented scores on IQ tests given approximately two years prior to the study.

Table 3.4 shows the mean IQ scores and the range of IQ scores by group and by grade. To provide additional information, these IQ scores were submitted to two-way analysis of variance to determine possible significant sources of variance within the sample. Main effects due to group (F = 20.39; p = .00) and to grade (F = 9.27; p = .00) were revealed. (Appendix G) Scheffé tests revealed a significant difference between the mean IQ scores of the Very Proficient and the Proficient reading groups at

Table 3.3

Means and Range of Chronological Age by Reading Group and by Grade

Grade	Reading Group	No. Ss.	Average Chronological Age in Years[a]	Age Range
4	Very Proficient	6	9.47	9.1- 9.9
	Proficient	6	9.44	9.0- 9.9
	Less Proficient	6	9.56	9.3- 9.9
6	Very Proficient	6	11.37	11.1-12.1
	Proficient	6	11.65	10.8-12.3
	Less Proficient	6	11.33	11.1-12.6
8	Very Proficient	6	13.40	12.5-13.9
	Proficient	6	13.64	13.3-14.1
	Less Proficient	6	13.52	12.4-13.9

[a] Age was measured to the nearest month as of February 1.

Table 3.4

Means and Range of IQ Scores by Reading Group and by Grades

Grade	Reading Group	Mean IQ	Range of IQ Scores
4	Very Proficient	133.17	125 - 136
	Proficient	115.83	102 - 130
	Less Proficient	122.60	111 - 130
6	Very Proficient	125.00	111 - 130
	Proficient	103.33	87 - 121
	Less Proficient	103.17	87 - 116
8	Very Proficient	130.33	114 - 134
	Proficient	115.33	107 - 120
	Less Proficient	112.60	106 - 121

the .001 level. The difference was in favor of the Very Proficient reading groups. Likewise, a significant difference ($p < .001$) was revealed between the mean IQ scores of the Very Proficient and the Less Proficient reading groups, in favor of the Very Proficient reading groups. Differences between the mean IQ scores of the Proficient and Less Proficient reading groups were not significant.

Scheffé tests revealed a significant difference between the mean IQ scores of grade 4 and grade 6 at the .001 level, in favor of grade 4. A significant difference between the mean IQ scores of grade 6 and grade 8 was also revealed at the .05 level, in favor of grade 8. There was no significant difference between the mean IQ scores of grades 4 and 8.

While there were no significant interaction effects ($p = .58$), the range of IQ scores within reading groups was considerable. As shown in Table 3.4, the highest IQ scores of Ss in the Proficient and Less Proficient reading groups were comparable to the IQ scores of the Very Proficient reading group; for example, the highest IQ score (130) in the range of IQ scores of the Less Proficient grade 4 reading group was comparable to IQ scores of some Ss in the Proficient and Very Proficient grade 4 reading groups.

4. Identification by number. - Each S was identified only by number. Numbers 1 to 54 were used, beginning with grade 4 Ss (Very Proficient to Less Proficient reading groups number 1 to 18) and concluding with grade 8 Ss (numbers 37 to 54). Odd numbers replaced girls' names and even numbers replaced boys' names. Consequently, it was possible to identify the reading group and the

grade of a S by his identification number.

The Research Instruments

The research instruments used in this study were constructed by the investigator. A description of the instruments and how they were constructed will be presented in Chapter IV.

The two tests designed to determine how the Ss in the study obtained word meaning from context were: (1) F. W. Tests - Sentences and Paragraphs and the (2) U. F. W. Tests - Sentences and Paragraphs.

A battery of word fluency tests was also compiled and utilized in the study.

Reliability of classification of contextual clues

The reliability of the classification of the five types of contextual clues embedded in the test items was calculated on the basis of the Arrington (1932) formula as reported by Feifel and Lorge (1950, p. 5) and established by inter-scorer agreement.

The percentage of agreement between investigator and two independent judges was calculated for each test. The four judges involved in establishing the reliability of the classification of contextual clues in test items were all graduate students and experienced teachers in the field of reading.

The percentage of agreement between investigator and the two independent judges in relation to test items in the F. W. Tests -

Sentences and Paragraphs was 96.55 per cent and 98.31 per cent; the percentage of agreement between the two judges was 96.55 per cent (Table 3.5).

Similarly, the percentage of agreement was established between two (different) independent judges and the investigator, concerning the reliability of classification of contextual clues embedded in test items of the U. F. W. Tests - Sentences and Paragraphs (Table 3.6). Percentage of agreement between investigator and the two independent judges was 98.35 percent and 91.58 per cent. Between the two judges there was 92.31 per cent agreement. The percentage of agreement between investigator and the four judges was satisfactory for the two tests when compared to other studies in which comparable percentages of agreement were accepted (Kruglov, 1953; Squire, 1964; Grant, 1972).

Collection of the Data

The experimental data for this study, obtained from the fifty-four Ss' responses to the experimental tasks presented to each S during individual interviews, were collected between February 17 and March 24, 1972. The tasks, compiled as tests (described later in the chapter), were presented by the investigator to each S during two individual interviews.

Only one interview was held per day with any one S. If possible, the second interview was held the day following the first interview. The two interviews with one S were never more than one

Table 3.5

Percentage of Agreement Between Investigator and Two Independent Judges Re: Classification of Embedded Contextual Clues in F. W. Tests - Sentences and Paragraphs

Independent Judges	Percentage of Agreement
1[a] and 2	96.55
1 and 3	98.31
2 and 3	96.55

[a] Investigator

Table 3.6

Percentage of Agreement Between Investigator and Two Independent Judges Re: Classification of Embedded Contextual Clues in U. F. W. Tests - Sentences and Paragraphs

Independent Judges	Percentage of Agreement
1[a] and 2	98.35
1 and 3	91.58
2 and 3	92.31

[a] Investigator

school week (five days) apart. Furthermore, if one interview with a S was held during the morning of the school day, the second interview was arranged for an afternoon period in order not to remove the S from the same class time more than once. Teachers were very co-operative in releasing Ss from their classes as requested. Through careful planning, no S was required to forego his favorite subject or activity, such as art, music, band practice, school assembly, or gym class, for an interview.

From the standpoint of the investigator, greater efficiency in interviewing was maintained by varying the daily schedule to include interviews with Ss differing in age and in reading ability. In so far as it was possible, no interviews were held with grade 4 Ss during the latter part of the school day. On the whole, daily schedules for interviews were arranged to create minimal disruption of regular classroom routines.

Data collected from the interviews were tape recorded and transcribed by the investigator to typewritten protocols.

Experimental Procedures

Experimental procedures determined by the second pilot study (described in Chapter IV) were closely observed. An outline of the procedures for each interview follows.

Interview 1

During the first fifteen minutes introductions were made, the purpose of the study was outlined to include the importance of the

S's role, and tape recording procedures were demonstrated by the investigator. Next, the S was encouraged to provide some information about himself, his family, and his special interests or hobbies. This information was tape recorded and played back for the enjoyment of the S and to acquaint him with recording procedures.

This brief introduction served two additional purposes: (1) it provided an opportunity to check the quality of the recording, and (2) it afforded valuable background information about each S, information not necessarily provided by the S's cumulative record.

Administration of word fluency tests

Directions for administration of the battery of word fluency tests are provided in Chapter IV. Each item was timed (one minute) with a stop watch. Approximately 10 to 12 minutes were required to give the directions, provide for practice, and administer the tests. The instructions for each task were read to the S. In addition, the S was provided with a copy of the instructions for each test item, typewritten on a 5" by 8" index card.

Administration of the *F. W. Tests - Sentences and Paragraphs*

Details of the *F. W. Tests - Sentences and Paragraphs*, constructed for this study by the investigator, are presented in Chapter IV. A copy of the tests is located in Appendix B.

The experimental tasks were compiled as tests for purposes of treatment of the data and for reporting the findings. They were not presented to the Ss as tests. Instead, each item was typewritten on a 5" by 8" index card and presented to each S, as a task, in the order of items shown in each subtest. Half of the Ss in each grade were presented first with the two subtests (sentences and paragraphs) having blank spaces to represent the familiar word missing from the context, followed by the two subtests (sentences and paragraphs) having nonsense words in place of the familiar word deleted from the context. The other half of the Ss in each grade were presented first with the two subtests having nonsense words to represent the familiar word deleted from the context, followed by the two remaining subtests having blank spaces to represent the familiar word deleted from the context. Each subtest was presented in the following order: (1) sentence items; (2) paragraph items; (3) sentence items; (4) paragraph items.

Specific directions for presentation of each sentence and paragraph item were as follows:

1. Each S was asked to read the sentence or paragraph item silently in order to determine what the familiar word missing from the context should be. Each S was also requested to give his response orally; that is, the missing word which he considered would best complete the context. If no response was elicited, the S was then asked to read the sentence or paragraph orally. As a result, the investigator was able to determine whether or not word recognition problems were a possible reason for the S's failure to complete the context.

2. If a word response was elicited from the S, the first

question asked by the investigator was, "What makes you think so?" Following the S's response to this question, a second question posed was, "Anything else?". Each S was informed before the tasks were first presented that the second question was always asked to provide the S with an opportunity to complete his response if anything was omitted in the first attempt. If, however, he had nothing more to add, the S was urged to reply to the second question by simply saying, "No."

3. When the S gave no response or a bizarre response, additional questions were asked to provide diagnostic information which might be useful in determining possible reasons for a S's failure to complete the meaning of the context; for example, in test items which contained words considered unfamiliar to grade 4, in terms of the Thorndike and Lorge (1944) word list, and with which a S was having difficulty in completing the meaning of the context, the S was asked what words, such as wistfully, fascinated, and fatal, meant.

4. The S was also informed that there were no time limits on the tasks presented.

Approximately 45 minutes was required for presentation of the F. W. Tests - Sentences and Paragraphs and for recording each S's responses.

Interview II

The purpose of the second interview with each S was to administer the vocabulary pretest of unfamiliar words and obtain his responses to the U. F. W. Tests - Sentences and Paragraphs (described in Chapter IV). Descriptions of the procedures adopted for this two-part individual interview follow.

Administration of the vocabulary pretest of unfamiliar words

From the list of words selected from the vocabulary subtest of the Stanford-Binet Intelligence Test, Form L (located in Appendix D), individual words were presented to each S. Each word, typewritten in primary-size print on a 3" by 5" index card, was presented to the S who was asked to pronounce the word and tell what it meant. If the S was not able to recognize the word immediately, the word was pronounced by the investigator. If the meaning of the word was unknown to the S, he was urged to say, "I don't know" rather than "guess" the meaning, since there were no penalties for wrong meanings. There was no time limit but, when it was apparent that the meaning of the word could not be recalled by the S, the investigator said, "Let's leave that word and try the next one."

Presentation of each word continued until 4 nouns, 4 verbs, and 2 adjectives were unfamiliar to the S; that is, the response given by the S was, "I don't know" or a bizarre meaning was elicited, indicating that the word was unfamiliar. To facilitate selection of the unfamiliar words for use in the U. F. W. Tests - Sentences and Paragraphs, the unfamiliar words were inconspicuously placed face up in the same pile as the words familiar to the S were placed face down. Consequently, the S tended also to be less aware of possible errors.

The time required to present the vocabulary pretest was approximately 5 minutes.

Presentation of U. F. W. Tests - Sentences and Paragraphs

Approximately 5-10 minutes were required to prepare the individual U. F. W. Tests - Sentences and Paragraphs. During that time, the S was asked to complete a brief, written interest questionnaire for the stated purpose of helping the investigator become better acquainted with each S, as well as to satisfy the intended purpose of keeping the S interested while materials for the next step in the interview were being made ready.

The five sentence items and the five paragraph items, which comprised the individual U. F. W. Tests - Sentences and Paragraphs, were selected according to the following plan:

a) Sentence items presented to each S were ordered in two ways: (1) by word form class of the underlined unfamiliar word (noun, verb, or adjective); and (2) by pattern of the embedded contextual clues.

Previous to each S's interview, one of the five patterns, shown in Figure 3.1, was randomly selected for later use in the individual U. F. W. Tests - Sentences and Paragraphs. If, for example, the pattern randomly drawn for a S was pattern V, the first sentence item contained a specifically embedded Contrast-type contextual clue (e), the second item contained a specifically

I	II	III	IV	V
a	b	c	d	e
b	c	d	e	a
c	d	e	a	b
d	e	a	b	c
e	a	b	c	d

Types of contextual clues:
a - Syn.
b - D/D.
c - L/E.
d - C/E.
e - Con.

Figure 3.1

Five Patterns for Ordering Sentences With Five Types of Embedded Contextual Clues embedded synonym-type contextual clue (a), followed by D/D(b), L/E(c), and C/E(d) types of contextual clues specifically embedded in sentence items. The test items were subsequently presented in that order to the S.

Immediately following the presentation of the vocabulary pretest of unfamiliar words (in isolation), when it became known which words were, in fact, unfamiliar to the S, five unfamiliar words (2 nouns, 2 verbs, and 1 adjective) were ordered for presentation. Appropriate sentence items were then selected to comprise the five-item U. F. W. Test - Sentences for the S.

Using pattern number V again as an example, if the first ordered unfamiliar word was a verb, the first test item presented to the S contained (1) an underlined unfamiliar word used as a verb and (2) a specifically embedded contrast-type contextual clue. If the second ordered unfamiliar word was a noun, the second sentence item presented contained (1) an underlined unfamiliar word used as a noun and (2) a specifically embedded synonym-type contextual clue. The remaining sentence items were selected following the same procedures.

The five remaining words, unfamiliar to the S (2 nouns, 2 verbs, and 1 adjective), were also presented in paragraph test items as ordered. Since some potential test items were constructed using the same unfamiliar words in sentences and in paragraphs, an adequate supply of less difficult words, considered more likely to be used in the test situation, was prepared. Care was taken in assembling the required sentence and paragraph items for each S to make certain that the unfamiliar word was available as a particular type of test item (i.e. sentence or paragraph).

The five sentence items were presented to the S before the five paragraph items were given. Before beginning the U. F. W. Tests - Sentences and Paragraphs, the S was informed that a pleasant surprise awaited him. Ten of the words which were unfamiliar to him were again being presented to him in sentences and paragraphs with the unfamiliar word underlined. The S was assured that he would probably have little difficulty in obtaining the meaning of the underlined word when it was presented to him in a sentence or a paragraph.

As each test item was presented to the S on a 5" by 8" index card, he was directed to read the test item silently. If the S was unable to recognize a particular word, he was urged to ask the investigator to pronounce the word. The S was also directed to respond as soon as he had decided what the underlined unfamiliar word meant. The investigator then asked the same questions as were posed in the F. W. Tests - Sentences and Paragraphs; namely, "What makes you think so?" and "Anything else?"

The length of time required to present the U. F. W. Tests - Sentences and Paragraphs and elicit responses from each S varied from 20 minutes to 35 minutes.

Treatment of the Data

No predetermined plans for analysis and treatment of the data were made. Instead, Ss' responses provided direction for devising procedures and techniques most appropriate for analyzing the protocols and reporting the findings. Following the analysis of the data, the decision was made to submit some data to statistical treatment.

Data submitted to statistical treatment were punched on data cards and processed by computer through the Division of Educational Services, Faculty of Education, University of Alberta. The following statistical procedures were used:

1. Two-way analysis of variance was employed to determine whether there was any significant interaction between reading groups and grade levels and whether there was any significant main effects on selected variables due to groups or grades. Scheffé tests were applied to determine between which groups or grades the difference in means was significant.

2. Single factor experiments with repeated measures to determine significant sources of variance due to: (1) word form class (2) type of embedded contextual clue were used.

3. Correlated t tests were used to determine the significance of the difference between the performance of Ss at each grade level (grades 4, 6, and 8 on the following pairs of tests:

a) F. W. Tests - Sentences and Paragraphs and U. F. W. Tests - Sentences and Paragraphs;

b) F. W. Tests - Sentences and F. W. Tests - Paragraphs;

c) U. F. W. Tests - Sentences and U. F. W. Tests - Paragraphs;

d) F. W. Tests - Sentences and Paragraphs (Blanks) and F. W. Tests - Sentences and Paragraphs (Nonsense).

4. Pearson Product Moment Correlations were calculated to determine the extent and the significance of the relationships among selected variables (standardized test scores and scores from reading tasks presented during the interviews).

Summary

In this study, designed to explore how word meaning was processed by developing readers (Very Proficient, Proficient, and Less Proficient) in grades 4, 6, and 8, introspective techniques were used. During two individual interviews with each of the fifty-four Ss, two types of reading tasks (tests) were presented. Following the silent reading of each test item, responses were elicited from the S. Responses consisted of: 1) a familiar word to complete the context of each item in the F. W. Tests - Sentences and Paragraphs, 2) the meaning of an underlined unfamiliar word in the U. F. W. Tests - Sentences and Paragraphs, 3) and the S's explanation of how the meaning of the context was completed for each item.

All responses were tape recorded, transcribed as written protocols, and analyzed by the investigator. Criteria for analysis of the data were determined by the nature of the Ss' responses and based on reported research and theories related to the reading process. Treatment of the data was statistical and descriptive.

CHAPTER IV

CONSTRUCTION OF THE RESEARCH INSTRUMENTS

The research instruments, to which reference was made in Chapter III, were constructed by the investigator. This chapter provides a description of the construction of the Familiar Words Tests (F. W. Tests) - Sentences and Paragraphs, the Unfamiliar Words Tests (U. F. W. Tests) - Sentences and Paragraphs, and the compilation of a battery of five fluency tests. Findings from two pilot studies will also be reported.

Construction of the Familiar Words Tests - Sentences and Paragraphs

Since the purpose of the study was to explore the processes used by Very Proficient, Proficient, and Less Proficient readers in grades 4, 6, and 8 to obtain word meaning from context, reading passages which afforded ample opportunities to use the context were essential. In the construction of test items sentences were not taken directly from textbooks and readers. They were considered unsuitable in that the majority of them were written to meet the needs of a particular grade or age level while subjects in this study were from three grades, with an age range from 9 years to 14 years. Trade books and basal readers, however, provided the basic ideas for many of the sentences and paragraph items constructed, particularly with respect to content and interests common to boys and girls in grades

4, 6, and 8.

During the interviews, sentences and paragraphs presented to the Ss were referred to as tasks rather than as tests. To facilitate the analysis of the data and clarify the description of the findings, the given tasks were grouped and labelled tests following construction of the sentence and paragraph items described in this chapter.

Criteria for construction of test items

Test items were constructed according to the following criteria.

Difficulty level

The major objective was to construct sentences and paragraphs at an appropriate level of difficulty to allow the verbal responses from Ss in grades 4, 6, and 8 to reflect the (reading) process of obtaining word meaning from context as fully as possible. Therefore, an appropriate level of difficulty for a test item was determined according to the following plan.

The difficulty level of the vocabulary of the reading passages was controlled by comparison to a standard of ease or difficulty. For this purpose the Thorndike and Lorge word list (1944) was used. At the time of word selection, The Teacher's Word Book of 30,000 Words (1944) was the only published list based upon a count of words found in children's reading matter. Although the list has not been revised since 1944, it has continued to have wide use and therefore, was considered reliable.

The first column of the word lists represents a summary of the four major lists based on the frequency of reading vocabulary (Thorndike & Lorge, 1944, p. x). Therefore, the difficulty level of the words used in test items was determined according to the word count represented by the number or letter in the first column. In order to meet the reading needs of grade 4 Ss, a large majority of the words used in test items had frequency counts ranging from AA to 20; that is, they were words which, according to Thorndike & Lorge (1944), should be familiar to children in grade 4.

As shown in Table 4.1, 94.10 per cent of the words in sentence items and 96.09 per cent of the words in paragraph items were within grade 4 level of difficulty as determined by the Thorndike and Lorge (1944) word frequency count. To provide further challenge for grade 4 Ss and to maintain the interest of older Ss in grades 6 and 8, the remaining words in test items ranged in difficulty by word counts from 19 (beyond grade 4) to 1 (beyond grade 8). In sentences the proportion of these more difficult words was 5.90 per cent; in paragraphs the proportion of more difficult words was 3.91 per cent.

With respect to the intended meanings of words deleted from the context of sentences and paragraph items, each test item could be completed with an appropriate word having a frequency count ranging from AA to 20, as determined by the Thorndike & Lorge word list; that is, a word considered within grade 4 level of reading ease.

A list of words representing the words intended to

Table 4.1

Proportion of Familiar and Unfamiliar Words in the F. W. Tests - Sentences and Paragraphs as Determined by the Thorndike & Lorge (1944) Word List

Test Items	Per cent Familiar Words	Range of Difficulty[a]	Per cent Unfamiliar Words	Range of Difficulty[b]
Sentences	94.10	AA to 20	5.90	19 to 2
Paragraphs	96.09	AA to 20	3.91	18 to 1

[a] Considered familiar for grade 4.

[b] Considered unfamiliar for grade 4.

complete the context of each test item in the F. W. Tests - Sentences and Paragraphs, and their corresponding frequency count (Thorndike & Lorge, 1944), is presented in Appendix B.

Interest level

Words were carefully selected in order not to offend the older reader by their simplicity. Topics selected for test items centred around family life, school activities, and subject matter familiar to pupils in grades 4, 6, and 8. An interesting possibility was that all Ss might bring to the reading tasks some knowledge relative to each familiar topic but individual differences in experiential background and depth of understanding might contribute to variability in responses.

Sentence length

Sentence test items varied in length from 8 to 28 words: the average length was 19.35 words. In paragraph items, sentence length varied from 5 to 24 words with an average of 56.2 words per paragraph. Paragraphs tended to be brief, the main purpose being to provide verbal clues relevant to the word missing from the context.

Types of embedded contextual devices

Dulin (1968) reported five types of contextual clues did, in fact, exist as generators of word meaning. Consequently, the same five types of contextual devices were embedded in sentence and paragraph items constructed for this study. The brief descriptions of each type of contextual clue which follows were adapted from the

Dulin (1968) study:

(a) Linked Synonyms and/or Appositives (Syn.): The familiar word missing from the context was paired or equated with a word, a group of words in a series, or separated by punctuation from an appositive or appositive phrase.

(b) Direct Description (D/D): Words, prepositional phrases, or subordinate clauses were used to define, describe, or explain the familiar word missing from the context and for which the reader seeks meaning.

(c) Contrast (Con.): Through the use of specific antonyms or definitive phrases and clauses which were the opposite in meaning to the familiar word missing from the context the meaning of the unknown word could be determined.

(d) Cause-Effect (C/E): The meaning of the familiar word missing from the context might be inferred by reasoning from cause to result or vice versa. Introductory words, such as *because*, *as*, and *since*, as well as linking words, such as *therefore*, were utilized in the test items.

(e) Language-Experience (L/E): The familiar word missing from the context was placed in such a linguistic or experiential setting that the reader was intuitively led to the intended meaning.

In each test item (sentence and paragraph) one of the five types of contextual devices, just described, was specifically embedded. While no guarantee could be given that other meaning cues were completely excluded, it was possible to give emphasis to the intentionally embedded contextual clue. Other words, phrases, or clauses were added when required to extend or clarify the intended meaning of the familiar word missing from the context.

Familiar word missing from the context

For each test item one familiar word was deleted from the context on the following basis:

(a) By grammatical class: According to recent research (Ames, 1965; Dulin, 1968; Quealy, 1968), mature readers differ in their ability to obtain the meaning of a meaning-bearing word deleted from the context. To determine whether or not maturing readers in grades 4, 6, and 8 differed in ability to complete the meaning of the context in relation to a missing noun, verb, adverb, or adjective, was one of the questions raised in this study. Therefore, the familiar words deleted from the context represented these four word form classes.

Robertson (1966) reported that pupils in grades 4 to 6 varied in their ability to utilize connectives effectively in their reading. She concluded that the general level of comprehension of connectives was too low for grades 4 to 6. These findings suggest that reasons for pupils' inefficiency in using connectives should be sought. Although the present study was directly concerned with how Ss obtained a familiar meaning-bearing word deleted from context, an attempt was made to determine whether or not selected function words were used as cues to help the Ss obtain the deleted word. For that purpose, after the test items were constructed, function words were selected (sentence number in parentheses) as follows: until (7B); with (8B); but (9B); in (10B); around (9N).

(b) Blank or nonsense words: Use of a blank space to denote a missing word has been a long-standing classroom practice, considered familiar to most pupils. Cloze tests designed to measure reading comprehension, first utilized by Taylor (1953), Jenkinson (1957), and Bormuth (1963) have become increasingly popular. Ames (1965) devised simulated or nonsense words to replace words deleted from the context. From reported research no evidence could be found which supports the effectiveness of the simulated word approach as compared to use of the cloze procedure. Hence, in this study half of the test items were prepared with blanks and, in the remaining half of the test items, nonsense (simulated) words were used in place of the word deleted from the context.

In general, Ames' (1965) plan for construction of nonsense words was followed. Letters were randomly selected to create a nonsense word bearing no resemblance to a "real" word. Care was taken that beginning letters were not the same as the "real" word or that syllables within the nonsense word might suggest the "real" word. The dictionary was used to make certain that each nonsense word did not officially exist. Inflectional and structural endings were also retained in order to keep the grammatical structure intact (Ames, 1965).

Unlike Ames' (1965) study, nonsense words were not devised to contain approximately the same number of letters as the "real" word. During preliminary trials of test items, more than one individual responding to an item reported using the number of letters in the nonsense word to help him "guess" what the "real" word might be. As a result, all deleted words (nonsense or blank) were designed of equal length. Ss were informed that the number of spaces or letters was not related to the meaning of the missing word.

The length of each nonsense word was determined on the basis of the average length of each deleted word intended by the investigator to complete the meaning of the context. The average length of each deleted word was 6.7 letters. Therefore, each nonsense word consisted of 7 letters and each blank space of 7 spaces. This practice compared favorably with a similar plan adopted by Voice (1968) in his study of contextual clues used by fifth grade readers. Voice (1968) calculated the number of letters used in each nonsense word according to the average number of words in the passages read by the fifth grade pupils. It was found to be 7 letters. In the present study, involving Ss in grades 4, 6, and 8, the use of a 7-letter nonsense word and a 7-space blank to represent the word missing from the context was therefore considered appropriate.

(c) Position of the deleted word in the sentence: An attempt was made to place the words missing from the context in one of three positions; namely, near the beginning of the sentence, near the middle, or near the end of the sentence. The term "near the beginning" meant that the deleted word was located in approximately the first third of the sentence; "near the middle" meant that the word was deleted within the second third of the sentence; and "near the end" meant that the deleted word belonged within the last third of the context.

Distribution of the deleted words, represented by a blank or a nonsense word, in the twenty sentence items and the ten paragraph items is shown in Table 4.2. In sentence items, words were missing near the beginning of 4 test items, near the middle of 4 test items, and near the end of 2 test items for each subtest (blanks and nonsense). In paragraph items, the familiar word was deleted near the beginning and near the end of 1 test item each, and near the middle of 3 test items (blanks and nonsense). Due to an error, when a necessary, last-minute change was made in the word deleted from one paragraph (2N), consideration was not given to position of the missing word. As a result, there was an imbalance in the positions of familiar words deleted from the context of paragraphs. "Near the middle" nonsense words were four in number, instead of the three intended, and there was no nonsense word placed "near the beginning" of a paragraph item.

The Familiar Words Tests - Sentences, referred to hereafter as the F. W. Tests - Sentences, consisted of two subtests -- Test 1 (Blanks) and Test 2 (Nonsense). The Familiar Words Tests - Paragraphs (F. W. Tests - Paragraphs) consisted of two subtests -- Test 1 (Blanks) and Test 2 (Nonsense). A copy of the complete test, the F. W. Tests - Sentences and Paragraphs, is located in Appendix B.

Construction of the Unfamiliar Words Tests - Sentences and Paragraphs

The vocabulary subtest of the Stanford-Binet Intelligence Test, Form L was utilized as a vocabulary pretest to determine ten

Table 4.2

Number and Placement of Deleted Familiar Words in F. W. Tests - Sentences and Paragraphs

Word Placement	Sentences		Paragraphs	
	Blanks	Nonsense	Blanks	Nonsense
Near Beginning	4	4	1	1 (0)[a]
Near Middle	4	4	3	3 (4)
Near End	2	2	1	1

[a] ( ) denotes necessary change due to error.

words which were unfamiliar to a S. Therefore, items constructed for use in an unfamiliar words test were based on words selected from the vocabulary subtest of the Stanford-Binet Intelligence Test, Form L. This vocabulary subtest was considered a reliable source of unfamiliar words because of its wide use in measurement of verbal ability of boys and girls within the same age range as the Ss in this study. It has also been used in research studies to determine the qualitative differences in vocabulary responses of children (Feifel and Lorge, 1950; Kruglov, 1953; Grant, 1965, 1972).

The following procedures were used in the selection of unfamiliar words and in the construction of test items based on the unfamiliar words selected.

Selection of unfamiliar words

Following administration of the vocabulary subtest of the Stanford-Binet Intelligence Test, Form L to eight children (grades 4, 6, and 8; average and above average in IQ) the decision was made to consider the word lotus as the possible beginning level of the unfamiliar words test items. Lotus was the first word for which some of the eight children began to give bizarre responses; for example, one definition elicited was, "It is a kind of grasshopper". Not all the words beyond lotus were included because it was predicted that some of the words would either be partially known by the Ss or they were considered too difficult to explain at a grade 4 reading level. Words such as shrewd, mosaic, and frustrate, for example, were excluded, even though they appeared later in the list than the word lotus, since they tended not to be completely unfamiliar to the majority of the eight children tested informally. On the other hand, ochre, casuistry, and achrematic were excluded because test items constructed with these words were unsatisfactory. Test items were constructed, each having one of the remaining unfamiliar words from the vocabulary subtest embedded in the context. To supplement the number of unfamiliar words representing verbs, five words (seclude, recede, afflict, and flout from the Weschler Intelligence Scale for Children and raze from the Peabody Vocabulary Test) were included. A copy of the U. F. Words Tests - Sentences and Paragraphs, provided in Appendix D, includes not only the actual test items utilized by the fifty-four Ss in the study, but also the total number of test items available for use, if required.

Construction of test items

One unfamiliar word was placed in each test item (sentence and paragraph) and underlined. Since the same test items were not necessarily presented to the same individuals, it was not possible to control the position of the underlined unfamiliar word in the same manner as was done for the missing familiar words. Nevertheless, an attempt was made to place the underlined unfamiliar word in a variety of positions; that is, near the beginning, near the middle, and near the end of the test items.

Difficulty level

The reading level of each test item was determined, following the same principle used in the construction of familiar word test items. Of the ten underlined unfamiliar words presented to different individuals as part of the U. F. Words Tests - Sentences, all ten words were beyond the grade 4 reading level, according to the Thorndike and Lorge (1944) word list; and all underlined unfamiliar words but the word repose were considered beyond the reading levels of grades 6 and 8. Of the remaining words used in the fifty sentence items (only five of which were read by any one S), only seventeen words out of the total number of words used in the sentence items were beyond grade 4 reading level, as determined by the Thorndike and Lorge (1944) word list. Similarly, in paragraph items, all of the underlined unfamiliar words were beyond grade 6 reading level and only one word, afflict, was considered familiar at the grade 8 level. An additional twenty-six unfamiliar words were placed in the thirteen paragraphs (excluding the paragraphs constructed but not read by any S).

Because of the difficulty level of the unfamiliar word for which the S attempted to obtain the meaning from the context, sentences were simply structured. Furthermore, specifically embedded contextual clues were probably more obvious in the U. F. Words Tests - Sentences and Paragraphs than they were in the majority of items in the F. W. Tests - Sentences and Paragraphs with the intention of limiting unfamiliarity of the test item content to the underlined unfamiliar word, in so far as it was possible.

With respect to word form class, only nouns, verbs, and adjectives were used as underlined unfamiliar words. Although omission of adverbs is considered a limitation of the study, they were excluded because construction of test items using adverbs obtained from the vocabulary subtests of the Stanford-Binet Intelligence Test, Form L, were considered unpractical.

A list of the words used in the vocabulary pretest is located in Appendix C.

Embedded contextual clues

At least one type of contextual device was embedded in each test item. The same five types of contextual devices (Syn., D/D, Con., C/E, and L/E, as defined on page 94) used in the F. W. Tests - Sentences and Paragraphs were also used in unfamiliar words test items. To increase the power of the five-item U. F. Words Tests - Sentences, the same unfamiliar word was placed in five sentences, each having specifically embedded in it one of the five different types of contextual clues. When the five unfamiliar words of a S became known during the interviews, an individual, five-item test, with each sentence containing a randomly determined contextual clue from the five embedded types, was quickly made ready for the S.

It is considered a limitation of the study that paragraph items were not constructed in a manner similar to the sentence items. In view of the time required to construct single paragraph items, the feasibility of constructing five times the number was considered beyond the scope of the study.

Other Research Instruments Used in the Study

Word fluency tests

Word fluency, which requires facility in producing words with or without structural limitations, may be related to the ability to obtain word meaning from the context. In order to explore this possibility, a series of word fluency tests was devised to satisfy the following criteria:

1. Word fluency with no structural limitations - The S was asked to think of as many words as he could in one minute (Stanford-Binet Intelligence Test, 1937).

2. Word fluency within structural limitations - Given one minute for each task (to conform with the time given for the word fluency test with no structural limitations), the S was asked to think of as many words as he could, according to the following structural limitations:

   (a) Words which begin with the letter m.
   (b) Words which rhyme with the word light.
   (c) Words which represent four-legged things.
   (d) Words which can be made from letters in the word occupation.

Ideas for this series of word fluency tests having structural limitations were drawn from a battery of word fluency tests designed by Sinclair (1966) to determine the relationship between word fluency and level of comprehension.

The Two Pilot Studies

Two pilot studies were conducted in two elementary schools in Edmonton, Alberta. Since the objectives of the two pilot studies differed, the discussion of the first (preliminary) pilot study will be followed by a description of the second (main) pilot study.

The preliminary pilot study

The problem of designing appropriate reading tasks for Ss in three grade levels was discussed in the previous section. The main purpose of the first pilot study was to assess the suitability of the sentence and paragraph items constructed relative to obtaining a familiar word deleted from the context. For the purpose of this study an item was considered suitable in terms of its ease or difficulty, its power in discriminating between the proficient and less proficient reader, and its freedom from negative feedback from pupils responding to the item in the pilot study, (for example, content considered too childish or too easy for a grade 8 pupil).

Four sets of test exercises, two sets having twenty-four sentences each and two sets with six paragraphs each, were prepared. In half the items, the deleted word was represented by a blank and in the remaining half, a nonsense word replaced the deleted familiar word. A copy of the four test exercises is located in Appendix A.

One grade 4 teacher and one grade 6 teacher, who also taught English in grade 8, supervised the groups of pupils selected by them to complete the test exercises. All pupils were in one elementary public school in Edmonton, Alberta, chosen by the Supervisor of Language Arts for the Board of Education. The school was chosen because its population was sufficiently large to make the selection of the required sample possible and because the teachers were highly competent.

From the population of grades 4, 6, and 8, groups of ten very proficient, proficient, and less proficient readers in each grade were selected by the teachers on the basis of standardized reading test scores available from pupils' records. For classroom reading instruction the pupils were grouped according to reading ability, making selection of the test sample and administration of the exercises relatively easy for the teachers.

The test exercises were completed between January 12 and January 18, 1972, according to schedules which disrupted the school program as little as possible. It was suggested, however, that the exercises be completed during two sessions or more. Teachers, rather than the investigator, supervised the completion of the test exercises because it was felt that pupils' reactions to the items might be elicited more freely before their classroom teachers than before a stranger. Written instructions were provided for teachers and for pupils. Teachers were also asked to read the instructions to the pupils, to answer questions if clarification of some tasks was necessary, and to assure the pupils that their best efforts would be appreciated as part of a research study. Teachers involved in the pilot study were contacted before the test exercises were given, during the week they were being completed, and later, to discuss results. Each teacher agreed to provide brief, written comments if pupils encountered problems in understanding the tasks or the directions and if pupils reacted verbally to the content and use of nonsense words, in particular.

The following comments were received from the teachers:

1. Careful explanation of the items utilizing nonsense words was essential, especially for grade 4 pupils.

2. Although some grade 4 pupils found some of the items very difficult, none of the grade 8 pupils reported that the items were too simple.

3. Less time was required by the grade 8 pupils to complete each exercise than was required by the pupils in grades 4 and 6.

4. There was one complaint from grade 6 pupils with respect to the content of one item. The writer was accused of male chauvinism. According to the pupils, one paragraph used as an example, tended to favor the boys to the consternation of the girls. (The paragraph was not used in the study.)

All exercises were scored by the investigator.

Assessment of sentence and paragraph items

All the items, based on subject matter content and general information commonly known to boys and girls in grades 4, 6, and 8, were considered to have content validity (Garrett, 1958, p. 362).

Difficulty index

The difficulty of an item was determined on the basis of the proportion of pupils responding accurately to the item. An item which 90 per cent of the pupils passed was easy; if only 10 per cent of the pupils passed an item it was hard (Garrett, 1958, p. 363). As indicated in Table 4.3, the number of easy items exceeded the number of moderately difficult items (8 moderately difficult items as compared to thirty easy items). With vocabulary controlled at the

Table 4.3

Distribution of Familiar Words Test Items According to Difficulty Indices

Test No.	No. Items By Difficulty Indices .000 to .249	.250 to .299	.300 to .399	.400 to .499	.500 to .599	.600 to .699	.700 to .799	.800 to .899	.900 to .999
1 (Blanks)	1	1	5	0	2	1	5	6	3
2 (Nonsense)	0	1	1	1	3	1	6	6	4

grade 4 level, it was difficult to maintain an appropriate difficulty level for older pupils. The situation was improved by eliminating easy items with a difficulty index greater than .83, thus reducing the excess of easy items by eleven items. At the other extreme, one item with a difficulty index less than .25 was withdrawn. The thirty-six remaining sentence and paragraph items were later reduced to twenty-five test items.

Discrimination index

The efficiency of each remaining test item was determined in relation to its discrimination index. A good item should have the power to discriminate between the proficient and less proficient readers. Out of the thirty pupils completing the test exercises, nine pupils formed the top 27 per cent of those with the most items correct. Out of the nine pupils, two were in grade 4, two were in grade 6, and the remaining five were in grade 8. Only two grade 8 pupils' scores fell in the low group. It appeared, therefore, that a representative number (4 out of 9) of the scores of younger pupils was in the top group of proficient readers.

The discrimination index of each item was calculated by the investigator. An item with a discrimination index of .33 was accepted. Although the level was slightly higher than the .20 level generally accepted (Garrett, 1958), the higher index was considered acceptable in view of the purpose of the test items.

As a result of the item analysis, the number of possible items for the familiar words tests was twenty-five sentences and ten paragraphs. Selection of the twenty sentences and ten paragraphs required for the F. W. Tests - Sentences and Paragraphs was made after the reliability of the classification of contextual clues was established by inter-rater scoring of the test items by two independent judges (as reported in Chapter III).

The main pilot study

After revisions were made in the F. W. Tests - Sentences and Paragraphs and construction and refinement of the U. F. W. Tests - Sentences and Paragraphs were completed, a second pilot study was undertaken prior to the main study. The purpose of the second (main) pilot study was two-fold: (1) to determine how effectively pupils in grades 4, 6, and 8 responded to the F. W. Tests - Sentences and Paragraphs, the U. F. W. Tests - Sentences and Paragraphs, and to the battery of word fluency tests in individual interview situations and (2) to refine techniques and procedures required for efficient interviewing in the main study.

During the latter part of January, 1972 nine pupils, three each from grades 4, 6, and 8 in one public elementary school in Edmonton, Alberta (a different school from the one used in the first pilot study), were individually interviewed by the investigator. Three individual interviews, each approximately forty-five minutes long were held in a quiet room assigned by the school principal. Pupils were selected by classroom teachers on the basis of criteria provided for selection of very proficient, proficient, and less proficient readers.

Pupils' responses to the F. W. Tests - Sentences and Paragraphs were satisfactory; that is, by increasing the difficulty of several test items, the grade 4 pupils appeared not to be at a disadvantage and older pupils in grades 6 and 8 responded positively to the tasks. Test items in the U. F. W. Tests - Sentences and Paragraphs appeared also to offer no major difficulties. Additional practice was required to increase efficiency in selection of individual test items for the U. F. W. Tests - Sentences and Paragraphs following the vocabulary pretest of unfamiliar words.

During the two interviews with each S several word fluency tests were given in order to make possible decisions concerning the most appropriate items to include in the battery of word fluency tests required for the main study. During preliminary trials with individuals, various test items and time limits, ranging from 2 minutes to 1 minute for each item, were tried. The purpose of this portion of the pilot study was to determine the most suitable time limits for selected tests.

For the purpose of finding out which items elicited the largest number of responses within the given time limit, the following tests were administered during the two interviews with each pupil (half of the items each time):

a) Words which begin with the letters m and s.

b) Words which rhyme with sing and light.

c) Words which begin with the prefix un- and re-.

d) Words which stand for round things; four-legged things.

e) Words which can be made with letters in the words occupation and transportation.

The time allowed for each test item was 1½ minutes. At the end of one minute the last word elicited was noted. Later, when the word count was completed, the decision was made to allow one minute for each test item, since few words were elicited during the last thirty seconds.

Test items eliciting the greatest number of appropriate responses from pupils in the pilot study were subsequently used in the main study. The following items were included in the battery of word fluency tests:

a) Words which begin with the letter m.

b) Words which rhyme with light.

c) Words which stand for four-legged things.

d) Words which can be made from the letters in the word occupation.

Some items were also retained for use as practice exercises, considered essential to clarify the task in each test item.

Observations made concerning interviewing procedures

Prior to the main pilot study, considerable preliminary piloting of test items was completed with individuals in settings less formal (at home, in a friend's home, at the university) than was experienced in the pilot study situation. The following observations made during the main pilot study were valuable in making necessary adjustments in interviewing techniques before commencing the main study.

1. To enter a strange school and establish favorable working relationships with principal and teachers of the children involved in the study, required careful planning and skillful execution. Without the co-operation of those people, it appeared highly probable that individual interviews with the pupils would have been less successful.

2. Efficient manipulation of tape recording equipment, in combination with other interviewing tasks, required practice. Since each child and each situation were different, the investigator was required to "shift gears" speedily but with apparent, outward ease.

3. A quiet room for interviewing, it was learned, was a room in which only the child and the investigator were present. The hum of school activities was everywhere, a natural situation when met in previous on-the-job interviews but, when faced in an important research project, the "noise" was somewhat disturbing, indicating that further conditioning of the investigator was essential.

4. Lastly, although the structured questions appeared to be satisfactory, it was revealed that valuable diagnostic information might be obtained when pupils' responses were inaccurate or if no word meaning was obtained from the context, providing the right questions were asked. Further practice was required in this area.

Following the main pilot study, necessary revisions in the order of presentation of the tasks were made and additional interviewing practice provided before the main study was begun.

Summary

Two tests, constructed by the investigator and described in the present chapter, constituted the main tasks presented in the Ss in the study. The test items were designed in such a way that the Ss were required to complete the meaning of the context of a sentence or paragraph in which there was an unknown word. In one set of tests (F. W. Tests - Sentences and Paragraphs) the unknown word was a familiar word deleted from the context and represented by a blank space or a nonsense word. In the other set of tests (U.F.W. Tests - Sentences and Paragraphs), the unknown word was an underlined unfamiliar word. In each test item, the context offered meaning cues as possible aids to the reader attempting to obtain meaning for the unknown word.

Lastly, a battery of five word fluency tests was compiled to be used in the main study for the purpose of exploring the possibility of a relationship between word fluency and ability to obtain word meaning from context.

All tests constructed by the investigator were first used in the pilot studies described in this chapter.

CHAPTER V

METHODS OF ANALYZING SUBJECTS' RESPONSES TO F. W. TESTS - SENTENCES AND PARAGRAPHS

As previously stated, no predetermined criteria were available for analysis of the experimental data. Instead, the fifty-four Ss' responses to the given reading tasks provided significant information which made possible a description of how word meaning was obtained from the context by the Very Proficient, Proficient and Less Proficient reading groups in grades 4, 6, and 8.

This chapter begins with an overview of the procedures developed to initiate the analysis of the experimental data obtained from Ss' responses to the reading tasks. Details specific to the analysis and treatment of the data obtained from the Ss' responses to the *F. W. Tests - Sentences and Paragraphs* are also provided. Details specific to the analysis of the data obtained from Ss' responses to the *U. F. W. Tests - Sentences and Paragraphs* are presented in Chapter VII.

Basic Procedures: Analysis of the Experimental Data

Overview: analysis of Ss' responses

Three main steps were taken which made possible a description of the processes used by the Ss to obtain word meaning from the context of sentences and paragraphs. A brief description of each step follows.

Step 1: Division of Ss' responses into manageable units -- All responses to each test item were divided into what seemed to be natural divisions. The following divisions were made of Ss' responses:

a) Division 1: An elicited word response, representing the unknown word (the familiar word missing from the context or the underlined unfamiliar word) and considered by the S to be a word of "best fit" to complete the context.

b) Division 2: A S's response to the questions posed by the investigator; namely, "What makes you think so?" and "Anything else?" This portion of the response represented, by way of retrospection, the S's report of what helped him determine the word response elicited to complete the context.

c) Division 3: The third part of the S's response included a brief attempt to recall how the passage was read in terms of i) when word meaning for the unknown word (familiar word deleted from the context or the underlined unfamiliar word in the context) first came to mind, and ii) the number of times the passage was read (in whole or in part) in order to complete the meaning of the context. As well, a limited number of Ss attempted to relate more specifically how they read, paused, thought, and continued to read in order to complete the meaning of the context.

To illustrate more specifically what is meant by the three divisions of the Ss' responses, two examples of Ss' responses are provided. The numbers 1, 2, and 3 above each response represent the division to which that part of the response belongs. Slashes (/) separate each division of the response.

Examples:

Subject #20 (Sentence 6B) - left[1] / Well, "instead of finishing[2] it" that means that he would have to leave it behind. And "partially done" that means he hadn't finished it, and "scattered" that means he'd have to leave it. And a "jigsaw puzzle" isn't something you carry around with you./

I read it through five times. I was[3] trying to think of a word to put in there. Leave. . .no, leave would not fit in. . . ./

Subject #9 (Paragraph 2N) - remembered[1]. . ./ Well, they chatted then[2] because they . . . John's Father "had been moved to Winnipeg" and then they remembered. They just remembered he was and they. . . they were silent because they didn't like. . .they didn't want him to./

Well, I read it once through and then after I[3] read it, I got it. Then I read it up to that word to see if it would fit in./

Step 2: Establishment of criteria to make possible a systematic analysis of the three divisions of Ss' responses -- To facilitate proceedings, one-third of the protocols (6 from each grade) were randomly selected and examined. A self-directed question was also posed in order to focus attention on the task. The question raised was: what specific information relative to the process used by Ss in grades 4, 6, and 8 to obtain word meaning from context would further analysis of each division of the Ss' responses reveal?

Independent judges assisted in establishing the reliability of the classification schemes devised by the investigator for each division of the Ss' responses by rescoring a random sample of the responses, according to the given criteria. If the initial criteria were not satisfactory, in that judges were unable to follow them without question, further adjustment was made in the criteria before final scoring of Ss' responses was completed.

Step 3: Treatment of the data and reporting of findings -- After the analysis of the experimental data was completed, some data were submitted to statistical tests. The remaining data were described in terms of the Ss' behavior.

Findings from the analysis of the experimental data will be reported in Chapters VI, VII, and VIII.

Ss' approach to the task of obtaining word meaning from context

While Ss' responses were being separated into the three divisions, it became evident that Ss across the grades tended to approach the task of obtaining word meaning in context in ways which might be considered typical reading behavior for these Ss. Direction for analyzing how word meaning was obtained from the context of sentences and paragraphs came from the fifty-four Ss' responses to the given reading tasks.

It appeared that the Very Proficient, Proficient, and Less Proficient reading groups in grades 4, 6, and 8 were using a basic two-fold approach to the task of obtaining the meaning of an unknown word which was either a familiar word deleted from the context or an unfamiliar word underlined in the context. Therefore, to make possible a description of how the Ss approached and completed the task of obtaining word meaning from context, their responses to the reading tasks were analyzed in terms of each of the following:

1. Use made of linguistic knowledge in order to decipher the linguistic information furnished by the context for the purpose of obtaining word meaning.

2. Use made of the intellect in order to obtain the meaning of an unknown word as intended by the context.

It was not possible to separate completely the language-thinking processes used by the Ss to obtain word meaning from context. For the purpose of interpreting responses, however, portions of Ss' responses which seemed to be mainly dependent upon use of linguistic information were classified apart from portions of the responses which appeared to be largely dependent upon use of the intellect. The limitations set by the experimental data for description of both aspects of the responses are outlined in the following section.

Use of Linguistic Information

Evidence that linguistic information provided by the context was used by the Ss was limited to the following:

1) Syntactic information in relation to
    a) Word form class and inflectional endings.
    b) Selected function words.
2) Semantic information in relation to
    a) Ability to control the language in terms of word responses.

b) Use made of embedded contextual clues and other meaning cues.

c) Reference to personal experience.

d) Processing "time" required to obtain word meaning.

e) Rereading to check meaning and to "make sure" that the word obtained "fit" the context.

It was assumed that the Ss made use of the graphophonic cues provided by the context (Goodman, 1973). Since the Ss were selected on the basis of a minimum vocabulary score, equivalent to the grade level or above, word recognition problems were minimized. Words not recognized by the Ss were pronounced by the investigator.

Definitions for the terms syntactic and semantic were obtained from Webster's New World Dictionary (1970). Syntactic means in accordance with the rules of grammar or syntax. Semantic is defined as pertaining to meaning, especially, meaning in language.

Syntactic Information

Word form class and inflectional endings

On the basis of the Ss' elicited responses (Division 1), syntactic information was obtained concerning the Ss' knowledge of grammar by way of word form class (noun, verb, adjective, adverb) and use of inflectional endings.

Out of the fifty word responses (4 omits) to sentence item 3N, for example, twenty-four word responses were considered unacceptable word responses in so far as completing the meaning of the sentence. All fifty word responses, however, were verbs stated in the past tense as required by the context. Words such as "grabbed", "threw", and "dropped" were among the inappropriate words selected by some Ss. Similarly, in response to paragraph item 5N, out of the sixteen unacceptable word responses, only one was not a noun, the expression "keep track". Word responses such as "memory", "book", and "paper" indicated the correct use of word class and even suggested that considerable meaning seemed to have been obtained by Ss unable to call to mind a more appropriate word response.

Ss' knowledge of grammatical rules in relation to the use of inflectional endings was also apparent. Examination of word responses with respect to use of correct word ending (e.g. "gives" instead of "give") or use of the suffix -ly (e.g. "confident" instead of "confidently") provided information.

Function words

From Division 2 of the Ss' responses, information concerning the use of selected function words was obtained. The six selected function words were: until and in (sentence 7B with in added following examination of Ss' responses); with (sentence 8B); but (sentence 9B); in (sentence 10B); and around (sentence 9N).

Evidence that the S used a particular function word was based on 1) a direct reference to the word in the S's response or 2) an indirect reference which implied that the function word was used in the process of completing the meaning of the context. As an example, in sentence 7B, grade 4 Ss tended to "guess" the meaning of the word "foliate", an unfamiliar word placed intentionally in the context. It seemed probable that the function word "until" was used by some Ss to aid them in deciding upon the word required to complete the meaning of sentence 7B. Subject #10, for example, in support of the word response "bare", explained it this way: "in the spring so it has to be winter 'cause it hasn't turned spring yet. . .until they get all their leaves back". Similarly, Subject #15 said that "foliate" meant "until they grow leaves in the spring."

On the other hand, it appeared that some Ss were unaware that the function word was important as, for example, in sentence 8B, Subject #53 used the word "gives" and supported it by "well, something has to sort of do something to give you the necessary energy" (with ignored). By contrast, Subject #49 chose an inferior word response ("fill") but stated, "I was thinking of 'with necessary energy'." Therefore, in seeking information concerning Ss' use of selected function words, consideration was given to Ss' reported use or failure to use available function words while processing word meaning from the context.

Semantic Information

Responses to test items provided an opportunity to determine how proficiently the fifty-four Ss in grades 4, 6, and 8 -- all users of language, processed the semantic information furnished by the context. A brief description of each type of semantic information revealed by the Ss' responses (i.e. the three divisions described in the previous section) follows.

Ability to control the language

The elicited word response was considered the "product" of the Ss' efforts to obtain the unknown word, a familiar word deleted from the context of sentences and paragraphs. It was conjectured, however, that if Ss' word responses did, in fact, complete the meaning of the context with an appropriate word, they should, in some way(s) reflect the process(es) by which the Ss obtained that appropriate word. For that reason, analysis of the data began with an examination of Ss' word responses (Division 1) which led to development of a classification scheme which made possible a qualifying, quantitative description of the Ss' word responses.

Criteria for classification of word responses

During the early stages of planning a classification scheme, the elicited word responses to each test item were first placed in one of two categories -- those which "made sense" and those which failed to "make sense" in the context. Traditionally, these word responses might be classed as "right" or "wrong". The next step was to compare the list of word responses which "made sense" to a prepared list of intended meanings conceived by the investigator (Located in Appendix B). It was discovered that the quality of the word responses which "made sense" tended to vary as did the reported reasons given by the Ss for having chosen the particular word to complete the context. Likewise, the degree that word responses failed to "make sense" was diverse. Variance of meaning of word responses in the "wrong" category ranged from word responses bearing no meaning to word responses bearing considerable meaning in relation to the Ss' interpretation of the context, although not as intended by the investigator. It was obvious that Ss' word responses represented more than a "rightness" or "wrongness" of a word response. There appeared to be different levels of understanding as represented by the language used to complete the context.

Criteria were therefore devised which made possible placement of the Ss' word responses into four categories or levels, instead of two (right or wrong). It was contended that word responses placed in the first category (Level 1) represented high sensitivity to language and a firm control of the quality of language used to complete the context. The second highest level (Level 2) represented word responses which indicated the S's ability to control the language in that the chosen word response "made sense" in the context but lacked the precision of a Level 1 word response. Level 3 word responses represented word responses which revealed that the S tended to lack adequate control of the language of the context and/or lacked also sufficient control of his own language to complete the meaning of the context with an acceptable word response. The fourth and lowest level of word response (Level 4) was reserved for word responses which revealed little or no control of the language of the context.

The following criteria were developed to determine the level of the elicited word responses to the F. W. Tests - Sentences and Paragraphs.

Level 1 - An elicited word response placed in this category was considered mature in that the elicited word satisfied the following requisites:

1. It was grammatically correct; that is, it was the correct part of speech and had the required structural or inflectional ending.

2. It was specific to the context and reflected a sensitive awareness of the language used by the writer to convey the intended meaning or the meaning as justified by the reader in his interpretation of the context.

For example, in response to sentence 4N, Subject #38 supplied the word "shy" and supported the response by "if you need help you usually ask the teacher or your classmates but, if you're too shy, I guess you don't want to do it. You associate 'extremely' with 'shy', especially when you're dealing with something strange."

Subject #15 first used the word "scared" but changed it to "shy" giving as reason, "because she did not ask her teacher and classmates for help."

Although the word "proud" was not included on the prepared list, its use was ably supported by some Ss, as shown in the following example:

Subject #40 - Because. . .uh. . .even though she did need help, she didn't ask because she'd feel foolish and it'd hurt her ego. Like, when she didn't do it, there was something strong holding her back and I suppose about the only thing it could be would be her pride.

Level 2 - A Level 2 elicited word response was required to satisfy the following criteria:

1. It was grammatically correct; that is, it was the required part of speech and had the necessary structural or inflectional ending.

2. The elicited word response completed the context in a meaningful way but with less precision or specificity than a word response for the same item placed in Level 1. It was considered a "good fit" as compared to the "best fit" of a Level 1 word response.

For example, in response to sentence 6B, the following response was considered a Level 2 response.

Subject #11 - slowly. Well, he had crutches so he'd have to walk pretty slow.

Some Ss suggested that there was a need for more than mere slowness of movement. Therefore, "slowly" was considered less explicit or precise than "cautiously" or "carefully" as used, for example, in the following Level 1 response:

Subject #41 - cautiously . . . "made his way" that infers a feeling of slow, not really fast moving. And then "avoiding basement stairs and slippery floors" that meant these would be a danger to him because he didn't have a firm footing.

Level 3 - A word response was placed in this category because it was considered unacceptable in that it would not be used to complete the intended meaning of the context. The word response, however, was considered superior to a Level 4 word response in that the S seemed to be using the context to obtain considerable meaning although not as intended by the context. The following criteria were developed for Level 3 word responses:

1. The word response was grammatically correct and had the correct structural or inflectional ending.

2. The word response indicated that the S seemed to have attempted to utilize the context but in so doing he ignored key ideas, failed to use sufficient evidence, or changed the context to satisfy his own interpretation of the context.

3. The elicited word response merely repeated a word used by the writer in the immediate environment of the missing word (i.e. in the same sentence), making sense but considered repetitious and therefore not a "good fit".

Examples of Level 3 word responses to sentence 8B follow.

Subject #30 - give. Well, it says "sugar and starches" make. . .give us "necessary energy".

Subject #5 - feed. . .It's the only word I can think of. "Sugar and starches" feed the body "with necessary energy."

Level 4 - A word response in Level 4 was considered unacceptable in that it exhibited at least one of the following characteristics:

1. The response was bizarre, unrelated to the context, the wrong word to "fit" the context, or the reasons given were uttered in such a state of confusion that little or no meaning was revealed.

2. No word response was elicited. Usually the subjects stated, "I can't get that one or simply, "I don't know."

Examples of bizarre responses:

Subject #43 - amazed - because, well, if he was "fascinated and completely absorbed," he'd be happy about their projects. Like he'd be surprised that they did so well.

(wrong meaning for "fascinated": confused; sentence 10N)

Subject #17 - take - it's sort of a one word sentence . . . Well, it coulda been "if you wish to take in whatever you set out to do. . ."

(bizarre: sentence #10B)

Subject #11 - grown. . .uh, well, it says there "completely". It'd have to be completely something.

(bizarre; limited use of available cues: sentence 7B)

It appeared, however, that even when the word response was judged Level 4 in quality, semantic and/or syntactic information was used to gain some meaning which was incorrect or obtuse although not always totally unrelated to the context. However, the cause of the failure to complete the meaning of the context accurately was not always clearly revealed in Level 4 responses.

Scoring word responses

A word response score was obtained for each S based on his word responses to the F. W. Tests - Sentences and Paragraphs. Numerical values were assigned in relation to the level of each word response. The values were as follows:

Level 1 - *4*; Level 2 - *3*; Level 3 - *2*; and Level 4 - *1*. That is, for each word response a S was given credit for attempting to obtain word meaning in relation to the quality of the elicited word response.

Reliability of scoring word responses

A random sample of fourteen Ss' responses to the *F. W. Tests - Sentences and Paragraphs* and the *U. F. W. Tests - Sentences and Paragraphs* was rescored by two independent judges to determine the reliability of the scheme for classifying Ss' responses. The percentages of agreement between investigator and the two independent judges, ranging from 93 per cent to 98 per cent, were considered acceptable. In Appendix F, Table F.1, percentages of agreement between independent judges and investigator are presented.

Use of meaning cues

At least one of the five selected types of contextual clues was embedded in each test item, sentences and paragraphs. In analyzing Ss' responses in relation to how these contextual clues were utilized in the process of obtaining word meaning, patterns of similarity in the responses were apparent. As a result, test items were divided into segments or units, representing cues which were reported by the Ss as having aided them in completing the meaning of the context. The following scheme was devised for analyzing and classifying Ss' responses in terms of meaning cues:

1. For purposes of description, each segment or unit of a S's response (Division 2) which made reference to a portion of the

given sentence or paragraph was considered a meaning cue. A meaning cue was defined as the smallest unit or segment of the sentence or paragraph item reported by the subject as being used to aid him in completing the meaning of the test item. It might include syntactic and/or semantic information. (The original term contextual clue was retained to distinguish the five selected types of contextual clues embedded in the context from the reported use of the context by the Ss in terms of meaning cues.)

2. A response to each test item was segmented into meaning cues on the basis of the smallest unit -- a word, phrase, or clause -- stated or implied by the subject as having helped him complete the meaning of the context.

3. A word signifying a meaning cue was limited to a noun (e.g. "bat", "seashell"), a verb (e.g. "occurred", "fly"), an intensifier (e.g. "completely", "fatal"), or a function word (e.g. "until", "around").

4. When the reported meaning cue was a phrase, it might be a verb phrase (e.g. "made his way"), a participle phrase (e.g. "standing in line"), a noun phrase (e.g. "a very selfish, young man"), or a preposition phrase (e.g. "in the spring").

5. A clause reported as a meaning cue might be a main clause (e.g. "Susan studied hard") or a subordinate clause (e.g. "if you wish to. . .").

6. A preposition was counted as part of the preposition phrase (e.g. "in the spring"). A conjunction, however, was considered separately (e.g. "but sometimes", considered two meaning cues

because some subjects used one with no reference to the other). A second example, found rather frequently in Ss' responses was, "*until spring*" where "they foliate" was by-passed (probably because the word "foliate" was unfamiliar) and the word "in" omitted to make sense possible through the expression "until spring." (2 meaning cues).

7. When a S implied that a specific word, phrase, or clause helped him to complete the meaning of the context, he was credited with the use of a meaning cue; for example, *Subject #6* concluded his response with, "Well, if there isn't any *light*, it must be dark," implying that the idea was drawn from "when there isn't the faintest glimmer of light."

To provide further clarification of how the number of meaning cues per sentence was determined, the following examples are provided:

(a) *Responses based on sentence 5N* -

Subject #3 - Well, *pitch* and black go together. And uh. . .there isn't any *light* and uh. . .and I know *bats* can't *fly* without light.

(4 meaning cues)

Subject #14 - *Pitch* dark. Well, it says not "*even the faintest glimmer of light*" so it's gotta be dark. . . . "*Safely*" and "pitch ZOVEDER" or whatever it is.

(3 meaning cues)

Subject #22 - I think. . .well, you usually use *pitch* in front of black if you're talking about a dark night and uh. . .I just glanced at that 'cause I was pretty sure it was pitch black. (inferred that he "glanced at "isn't. . .*light*")

(2 meaning cues)

Subject #42 - dark. . .well, because the *bat* has a sixth sense, even if it is dark, you know, they haven't got eyes, or anything but they miss things by inches so it doesn't matter if it's dark out or *light.* I was thinking of *pitch* something. You say pitch dark or something. (3 meaning cues)

Since no additional meaning cues were reported by any of the fifty-four Ss, sentence 5N was divided into five meaning cues as follows:

1 2 3 4
A *bat* / *can fly* about *safely* / in *pitch* ZOVEDER / , even
5
when there isn't the faintest glimmer of light.

(b) *Responses to paragraph #1B,* were divided, on the basis of Ss' responses, into six different meaning cues.

Subject #25 - Well, if you see something in the dark, it has to be *lighted.*

(1 meaning cue)

Subject #30 - Well, because sometimes *on a clear night* you can see *shooting stars*. . .and oh, shooting stars always give off light so that's how I got that one.

(2 meaning cues)

Subject #37 - Well, *flashing* and *streaks* called *meteors* and that was it. (3 meaning cues)

Subject #54 - Well, *meteors* are *streaks* of light and that's why I picked meteors. (2 meaning cues)

From the examples provided, individual differences in utilizing meaning cues may be seen. It was also apparent that subjects were surveying the context and seemed to be using parts of the context other than the segments directly related to the embedded contextual clue.

Embedded meaning cues versus other meaning cues

Ss' responses revealed that it was possible to examine not only whether the Ss utilized the five types of contextual clues specifically embedded in the context but also how the Ss tended to use them. It was also revealed that some cues identified by the Ss as having aided them in obtaining word meaning were meaning cues other than the specifically embedded contextual devices. Therefore, two types of meaning cues were identified from Ss' responses.

An embedded (E) meaning cue was defined as one unit or segment of a contextual device placed specifically in the context by the investigator. A sentence, for example, constructed with one Contrast-type contextual clue embedded in the context might be represented in a S's response by one or more segments or units, each identified as an embedded meaning cue. That is, five types of contextual clues were embedded by the investigator but, when identified as Ss' responses, they were labelled embedded (E) meaning cues.

An other (O) meaning cue was defined as one unit or segment of the context which did not represent the contextual clue specifically embedded in the context but, according to the Ss' responses, served as an aid in obtaining the meaning of the unknown word in the context.

Hereafter, meaning cues may be referred to as E meaning cues and O meaning cues.

For example, according to the responses of the Ss, six different meaning cues were utilized to complete the meaning of sentence 7B. Each underlined part of the sentence represents one meaning cue. The letters above the sentence represent the segments, designated as E or O cues.

O E O E
In our country most trees are completely . . . until they
E E
foliate in the spring.

A summary of the total number of E and O cues in the *F. W. Tests - Sentences and Paragraphs* is presented in Table 5.1.

Table 5.1

Total Number of Different E and O Meaning Cues in the *F. W. Tests - Sentences and Paragraphs*, Based on Ss' Responses

Type of Meaning Cue	Sentences		Paragraphs	
	Blank	Nonsense	Blank	Nonsense
Embedded (E)	32	34	11	15
Other (O)	16	18	16	14
Total	48	52	27	29

Out of a total number of 100 different meaning cues, 66 were embedded (E) type meaning cues and 34 were other (O) meaning cues in the sentence items. In paragraph items, subjects reported using 26 different E meaning cues and 30 O meaning cues. The segmentation of meaning cues in the F. W. Tests - Sentences and Paragraphs, as determined by Ss' responses, is presented in Appendix B .

Single meaning cues

Although the average number of meaning cues used by the fifty-four Ss might be considered the minimal cues required by these subjects for the purpose of obtaining word meaning from the context, it was noted that single meaning cues were also utilized. To determine the extent of their use, the percentage of word responses reported as being based on a single meaning cue was calculated. The following responses were selected to illustrate the type of response considered representative of using a single meaning cue:

Subject #2 - Sadly. . .uh, sorrowfully. (Anything else?) No.

Subject #19 - Well, there was not the faintest glimmer of light.

Subject #21 - Slowly because you can't go fast on crutches.

Subject #53 - Well, if he's sometimes unpredictable, then it wouldn't be always and it wouldn't be never.

Since not all the single meaning cues used were followed by an acceptable word response, the percentage of single meaning cues used to obtain an acceptable word response was compared to the total number of single mean cues reportedly used to obtain word meaning for sentences and paragraphs.

Reliability of classification scheme and scoring procedures

The same two independent judges responsible for assisting in establishing reliability of scoring the meaning cues were also responsible for assisting in establishing the reliability of the reasoning scores. For this purpose, the responses of seven Ss (randomly selected) were rescored independently by the two judges. The percentage of agreement for scoring both types of responses ranged from 85 per cent to 92 per cent (Appendix F, Table F.2).

Treatment of the data

A numerical value of 1 was attached to each meaning cue to make qualitative measurement possible. To determine whether there was a significant difference in the number of meaning cues reportedly used by Very Proficient, Proficient, and Less Proficient reading groups in grades 4, 6, and 8, the data were submitted to a two-way analysis of variance program. The percentages of E meaning cues and O meaning cues were also determined for purposes of discussion.

Reference to personal experience

It was assumed that without the necessary experiential background, Ss in this study might not have been able to use the semantic information afforded by the context. Although all the Ss' responses seemed to reflect the experiential background and knowledge of those making the responses, it was only when specific reference was made to personal experience that the response was considered as evidence that use of personal experience helped the S [illegible] word meaning from context. Ss' responses were, therefore, examined to determine the extent that specific reference was made by the Ss to personal experiences, in relation to the context from which word meaning was being sought.

References made to personal experiences in the Ss' responses to the F. W. Tests - Sentences and Paragraphs (and to the U. F. W. Tests - Sentences and Paragraphs discussed in Chapter VII) were classified under three categories, described as follows:

1. School experiences which included references made to subject areas, books, teachers, and activities, such as sports - The following examples indicate how the context of the test item seems to have called to mind the past experiences referred to by these Ss:

Subject #1 - Well, in a book on magnets I read that. . .

Subject #5 - Horseshoe magnets usually have red on them.

Subject #38 - Well, we took that last year in science.

Subject #24 - That's what our teacher says when we're doing something wrong.

2. Personal experiences outside of school, including travel, family happenings and the like - Examples of Ss' reference to this type of experience include the following:

Subject #4 - Castles have long torches in the hall and things so that's what I think. When we were in England we went to Wales. We went to London and England and then we went to the south of England to be at my cousin's. . .and Joan suggested Pamsey Castle and we went and there were halls and they store the torch things.

Subject #24 - I watch TV and I read the paper a lot and I hear lots of people say "rough and uncut jewels were stolen" so I just put that in there and it worked out.

Subject #46 - Well, some people keep. . .get a scrapbook and keep a recording of his favorite clippings or things like this.

Subject #45 - Because that's what my brother does all the time.

Subject #16 - Well, . . .when two cars hit. . .going around a corner and another one coming, probably this one car was passing. . . .

3. Highly personal experience - Responses designated highly personal were those in which the emphasis of the experience was upon self. Even this type of experience could be subdivided in that sometimes the reference was highly egocentric with emphasis on "I", while in other examples it might appear with the more modest "you" (meaning "I") as subject. Examples of these two types of highly personal experience from Ss' responses follow:

a) Egocentric - type experiences.

Subject #3 - I just heard my Mom say yesterday that I have talent for my dancing lessons.

Subject #42 - I get that criped at me at home all the time.

Subject #24 - . . .and so do I feel pretty happy, like last social test, I was sure I was gonna pass it and I did.

Subject #6 - I watched the Winter Games.

b) Self-oriented - type experience, with "you" as subject.

Subject #20 - Sometimes you have to get something inside you to do it. You have to make yourself. Like in hockey, you have to make yourself shoot.

Subject #2 - Well, when you're fascinated, you rather like things.

Subject #38 - Well, because of my safety hunter's course. You can't just throw up your gun and take a shot -- you'll miss.

Subject #3 - When you're fascinated you think something is interesting. You're deep into it. You don't think it's boring.

While it is probable that the reasons given by the Ss were very personal, they tended to treat them less personally than did the subjects in the examples of "I"-oriented responses.

As can be seen from the examples, references to personal experience could not always be readily classified as one type over another. Therefore, when it was necessary to make a choice, the response was placed in the category which seemed best to exemplify that experience; that is, each response was not placed in more than one category although there was considerable overlapping of some experiences.

A frequency count of references to personal experiences was made for purposes of further discussions of the findings in Chapter VI.

Processing "time" to obtain word meaning

The third portion of the Ss' responses (Division III) was analyzed to determine how much reading (processing) was required to obtain the missing word. Each response was not timed with a stop watch for at least three reasons:

(1) the subject might consider speed of response at the expense of describing how he completed the task;

(2) the investigator might become too involved in timing the brief responses to the neglect of more important interviewing tasks;

(3) measurement of time spent in processing the context was considered less important than learning as much as possible about how the context was processed.

Furthermore, each response, if timed by a beginning and ending signal which was recorded for later measurement, might not be accurate since there was no guarantee that the S would begin his explanation of his response until prompted.

As an alternative, subjects were asked two questions following the explanation of each word response. The first question required the S to recall, in so far as he was able, where he was in the reading of the sentence (paragraph) when the missing word first came to mind. The second question was; "How many times did you read the sentence (paragraph) before completing the meaning of the context?" Only one S (grade 4) suggested that she could not remember well because she had a "poor memory." Infrequently a S stated that he was not certain if he "read it two or three times." On the whole, Ss were very sincere in their efforts to report how the passage was read. Therefore, a summary of individual differences in "time" required to read different passages as well as differences between individual reading (processing) "time" of the same passage was made available.

Examination of the fifty-four Ss' concerning how the passages were read revealed that five main processing "times" tended to be reported by the Ss. The following criteria were established to make discussion of the findings possible:

1) During first reading - The S stated that the missing word came to mind to complete the context while reading the sentence (paragraph) the first time. In addition, the S reported one of two things: (1) the response was given without completing the reading of the passage or (2) the response was given after the remainder of the context was read. For example,

Subject #5 - I just read up to there (ZOGUJLY) and tried to figure out the word and then read the rest.

Likewise, Subject #30 stated, Once, all the way through. I filled it in as I went along.

On the other hand, Subject #14 said, I read it up to that "early hour". Subject #28 - reported, I read it over to "wise and adorable" and then I put the word in there and I read it over. Subject #39 - Well, I read it over until about "metal objects" and then I thought of the word. "Around" made me think of area and "metal objects are affected" was the area.

(b) At the end of the first reading - For responses placed in this category, Ss stated that the sentence (paragraph) was read once with word meaning reported to have come to mind in one of three ways:

i) As soon as the S finished reading the passage;

ii) After completing the reading of the passage, the S said that he thought about the sentence but gave no specific information concerning his thoughts;

iii) After completing the reading of the passage, the S stated that he "looked back up to check" specified parts of the passage.

Examples of Ss' responses placed under (b) include the following:

Subject #20 - I only read it once. I put force in after I read it through.

Subject #37 - Well, I read it through once and I tried to think of a word.

Subject #10 - I read it through once, thought of a word, put it in and it sounded good.

Subject #38 - First I read the sentence and then I looked at "wise and adorable" and "lovable".

Subject #50 - I read it through once. It just came to me.

(c) During the second reading - When meaning was obtained during the second reading of the passage, a S's responses indicated one of the following:

i) The second reading of the passage continued only until the missing word came to mind. Then the word response was given;

ii) The second reading of the passage continued after the missing word came to mind in order to "make sure" nothing was being omitted;

iii) The second reading of the passage consisted of reading parts of the sentence. A "part" was described as "before the blank (or nonsense) word" or "around the blank (or nonsense) word." In a paragraph it might be "the sentence with the blank (or nonsense) word in it."

For example, the following explanations of reading the sentences were given:

Subject #5 - As I came to it (the blank) the second time.

Subject #19 - I read it over once but went over it to "deeply" something. I went over that to get the word. (involved in Sentence 10N)

Subject #43 - I got "succeed" at the start of the second time. "If you wish to succeed. . . ." (Sentence 10B)

Subject #20 - I read it through and then "pitch" what? "pitch" what? (blackness in Sentence 5N).

Subject #12 - First I read it and then I read it and got the word and read the rest. (anxiously in Sentence 2N).

(d) At the end of second reading - Responses were placed in this category when the S reported that the passage was read twice before word meaning was obtained in one of the three ways as outlined when word meaning was obtained at the end of first reading (b). For example, the following statements were made:

Subject #2 - I read it through once and at the end of the second time through I got the word (force in Sentence 9N).

Subject #13 - I only read it twice. (Sentence 3B)

Subject #52 - I read it over twice and I thought of a word (carefully) I did not read it a third time (Sentence 6B).

(e) After three or more readings - When a S reported reading a passage more than twice to complete the meaning of the context, the response was placed in this category. According to Ss' responses, the number of required readings ranged from three to six times before a a word that "made sense" to the S (and sometimes the intended meaning) was obtained to complete the context. Examples of Ss' responses follow:

Subject #3 - I read it twice without any idea and then, reading it the third time, I thought of the word (greedily in Sentence 7N).

Subject #9 - Well, I read it four times. On the fifth time I got it while I was reading it (cool in Sentence 8N).

Subject #24 - Well, I think it took me about five times. I don't think it was because it was long because we get real long sentences in language and I get lots of them. (scared in Sentence 4N)

When no word response was made, no classification of the number of times the passage was read was made. Ss tended to give up eventually with the comment, "I can't think of a word" or, if they continued to struggle unsuccessfully, it was suggested that the passage be left. Such responses were labelled "Omits". For each of the five categories, designating how much reading was done by the Ss in order to obtain word meaning, the percentage of responses by group and by grade was determined on the basis of total number of: (a) word responses and (b) acceptable (Level 1 and Level 2) word responses.

Rereading to check meaning and to "make sure"

From the third part (Division III) of the elicited response it was possible to explore not only the extent passages were reread after word meaning was obtained but also why they were reread as revealed by the Ss' responses. The following examples of Ss' responses to Sentence 9N, one of the more difficult test items, was drawn to illustrate that, ranging from the Less Proficient reader in grade 4 to the Very Proficient reader in grade 8, Ss reported rereading the context "to make sure".

Subject #18 - force. . .I just read up to there ("objects") and I stopped and I tried to think of a word. I got force the first time and so I read it again to "make sure".

Subject #12 - field. . .I got the word and I read it again.

Subject #45 - force. . .Only once and then I put the word in and read it over again.

Subject #39 - area - I read it over until about "metal objects" and then I thought of the word and read it over again.

The following examples, taken from Ss' responses to paragraph 2N, indicated that paragraphs were also reread.

Subject #31 - realized - Well, I read it over just once and then I looked over and then just the sentence with it in.

Subject #8 - noticed - Well, I read it once and I didn't understand it so I read it again and then I got the word. I read over that sentence again.

Subject #37 - realized -. . .Well, I read it once and then I read it over again to see if it would fit.

To facilitate discussion of the findings, the percentage of sentences and paragraphs reread after completing the context was determined by group and by grade.

Use of the Intellect

From the second portion of the Ss' responses (Division II) two types of information were obtained. In relation to the elicited word response Ss' reported: (1) what meaning cues helped them obtain the missing word (procedures for analysis outlined earlier in the chapter) and (2) how the meaning cues helped them obtain word meaning from the context; that is, in retrospect, the Ss attempted to explain how the problem of the missing word was solved. Subsequently, from the Ss' responses, inferences were made concerning the main cognitive skill(s) activated by the task.

Use of Reasoning

Criteria for classification of reasoning

On the basis of Ss' responses to the F. W. Tests - Sentences and Paragraphs and to the U. F. W. Tests - Sentences and Paragraphs (discussed in Chapter VII), reasoning scores were obtained. Judgment of the reasoning was based on criteria developed to satisfy the characteristics attributed to: (a) good; (b) fair; and (c) faulty reasoning. The criteria were as follows:

a) Good reasoning - For the reasoning in a response to be considered good, the following requisites must be met:

1. The response stated clearly the relationship between the elicited word response (the missing word) and specific words, phrases, or clauses in the context. The statement made concerning the relationship might be by way of (i) an explanation or (ii) a judgment wherein a conclusion was drawn.

2. If the response was in the form of an explanation, it might begin with "because", followed by an explanation for having

chosen a particular word response; for example, as in the following Ss' responses:

Subject #20 - left - Well, "instead of finishing it" that means he would have to leave it behind. And "partially done" that means he didn't finish it. And "scattered" that means he'd have to leave it. And a "jigsaw puzzle" isn't some thing you carry around with you.

Subject #4 - I think left would go in there because "partially done" would mean that it wasn't all done and then "instead of finishing" the "jigsaw puzzle", Arthur left it.

3. If the response was in the form of a judgment, it usually began with "if" or "because" and concluded with "and so" or "therefore" (stated or implied). Examples of this type of response were as follows:

Subject #39 - Because it said "fresh and crisp" and that it was an "early hour" and so it must have been in the morning.

Subject #38 - shy - Well, if you need help you usually "ask the teacher" or your "classmates" but, if you're too shy, I guess you don't want to do it.

4. If no direct explanation of the relationships between the elicited word response and specific parts of the context was given but the S gave, instead, a mature, precise word response (Level 1), followed by the listing of well-selected meaning cues, it might be inferred that the reasoning was good, even though implied rather than stated clearly. It is possible that the reason was so obvious to the S that he considered his explanation adequate by stating the meaning cues with minimum explanation.

Responses such as the following were placed in this category:

Subject #25 - (responding to sentence 5N) darkness - Well, there was "not the faintest glimmer of light". (single meaning cue and Level 1 word response)

Subject #39 - (responding to sentence 8N) morning - Well, it says "at that early hour". (single meaning cue and a Level 1 word response)

Subject #37 - (responding to sentence 6N) sadly - Well, "sorrowfully" and "he looked back wistfully". (2 key meaning cues, relationship to "sadly" implied)

b) Fair reasoning - For the reasoning to be considered fair rather than good, the following characteristics seemed to pervade the Ss' responses:

1. The level of understanding, as determined by the S's explanation of the relationship between the selected meaning cue(s) and the elicited word response, was less explicit and direct than was the understanding of a response considered "good" reasoning.

2. The response usually included introductory words such as "because" or "if" and might conclude with "and so" or "therefore" (stated or implied). For example,

Subject #16 - (paragraph 2N) slowly - ". . .step by step" and "edged his way". You can't edge things real fast, you might get cut or something. . .if you want to be safe you should go pretty slow. (as opposed to being cautious or careful)

Subject #15 - (paragraph 5B) - note - because he decided that "he would add enjoyment" by keeping a note of the "most exciting events of the holiday." (*note* less explicit than *diary* or *log*, which use of additional cues might have helped call to mind; that is, limited use of context was apparent.)

Subject #54 (sentence 6N) - *reluctantly* - Well, he didn't really want to do it. It says he "looked back" and it says he "set out to seek a new life . . . ."

("sorrowfully" and "wistfully" omitted in the discussion)

(c) Faulty reasoning - Evidence of faulty reasoning was inferred from S's responses which, in general, seemed to confuse the relationships between the missing word and the meaning cues provided in the context. More specifically, faulty reasoning was characterized by one or more of the following weaknesses:

1. Insufficient evidence - The S tended to omit or to ignore one or more important meaning cue(s); for example, a function word such as *under*, *with*, *but*, or a content word (noun, verb, etc.), essential to an understanding of the passage.

2. Change of context - Sometimes the S changed the context to provide satisfactory meaning to him but not as intended by the writer, either by adding word(s) to the context or by rearranging the given words, or by altering the punctuation.

3. Apparent limitation of experiential background; that is, the S made reference to personal experiences which seemed to have been too limited to make understanding of the context feasible.

4. Paucity of vocabulary - The S seemed unable to call to

mind a word response which would allow him to reason adequately.

5. Inability of the S to provide any reasons for choosing an elicited word response which had little or no meaning in the particular context.

Although more than one of the above characteristics might be found in one response, for purposes of scoring, only one demerit was counted for faulty reasoning. Details of scoring follow in the next section. Examples of faulty reasoning:

Subject #26 - (sentence #4N) - stubborn - Well, you know, if she wanted to do the math, she would have asked her "teacher or her classmates" to help her. If she didn't want to do it, she wouldn't ask. (Change of context or influenced by personal experience.)

Subject #29 - (sentence 4N) - rude . . .I don't think she asked her classmates because she was dumb and she fought with them lots of times. (Key meaning cues neglected; personal experience may have influenced the S's thinking.)

Subject #14 (paragraph 3B) - diskind - Well, it says, "Jonathon was considered . . .young man." He wasn't very nice. . .he "thought mainly of his own needs and desires . . .his friends called him piggish." (Paucity of vocabulary)

Subject #13 (paragraph 5N) - served - . . .and since they were so hungry and starving, their father and mother who usually put food on their plates or something or maybe they were kinda late getting to the table so the boys helped. . .they served themselves. ("On" seems to have been omitted; key cues were not emphasized; or it could have been paucity of vocabulary and/or limited experience.)

Scoring of reasoning measures

A quantitative measure of each S's reasoning ability, based on a qualifying judgment of all responses to the F. W. Tests - Sentences and Paragraphs, was obtained. The following numerical values were assigned to each response to a test item in terms of quality of reasoning: for good reasoning, 2; for fair reasoning, 1; for faulty reasoning, -1.

Reliability of scoring reasoning measures

As previously indicated in this chapter, two independent judges helped establish the reliability of the scores for meaning cues and for reasoning. Percentage of agreement between the investigator and the two independent judges ranged from 85 per cent to 92 per cent (Appendix F, Table F.2).

Summary

Responses of the fifty-four Ss to the F. W. Tests - Sentences and Paragraphs were divided into three parts: (1) the elicited word response; (2) the Ss' explanations of the reading process in terms of how word meaning was obtained from the context; and (3) the Ss' description of how the context was read in terms of (i) recalling when, during the reading of the passage, the unknown word first came to mind and (ii) the number of times the passage was read before word meaning (the unknown word) was considered acceptable (i.e. "fit" the context to the S's satisfaction).

A basic framework for analyzing the experimental data in this study was developed in relation to the ways in which the Ss -- Very Proficient, Proficient, and Less Proficient reading groups in grades 4, 6, and 8 -- approached the reading task of completing the meaning of the context by obtaining the unknown word, a familiar word deleted from the context.

The main elements of the analysis of Ss' responses are presented in the following outline:

Ss' Approach to the Task of Obtaining Word Meaning from Context

I. Use of linguistic knowledge and given linguistic information -
    A. Syntactic information: its use revealed by
        1. Word form class and inflectional endings of unknown words.
        2. Selected function words in the context (in, until, with, but, around).
    B. Semantic information: its use revealed by
        1. Control of the language as determined by Ss' word responses.
        2. Embedded contextual clues and other meaning cues.
        3. Reference to personal experience.
        4. Reported processing "time" required to obtain word meaning.
        5. Reported rereading done to check meaning and to "make sure" that the missing word "fit" the context.
II. Use of the intellect -
    A. Reasoning: used to explain the relationship between the word response and the other segments of the context.
    B. Reasoning: used to make judgments or to draw conclusions.

CHAPTER VI

FINDINGS: ANALYSIS OF F. W. TESTS - SENTENCES AND PARAGRAPHS

This chapter is concerned with reporting how the meaning of unknown words (familiar words deleted from the context) was obtained by Very Proficient, Proficient, and Less Proficient reading groups in grades 4, 6, and 8. The findings, reported mainly in terms of the variables determined by the Ss' responses to the F. W. Tests - Sentences and Paragraphs, are presented within the basic framework devised for analyzing the responses as described in Chapter V; that is, in terms of the Ss' use of (1) linguistic information (syntactic and semantic) provided by the context and (2) their intellectual ability to interpret the meaning of the context.

Where experimental data were submitted to statistical treatment, findings were reported in terms of the significance of mean differences between variables, representing different aspects of Ss' responses, by group and by grade. Since there were no significant interaction effects between groups and grades for any of the treatments, reporting of these findings is confined to two-way analysis of variance tables located in Appendix G. Tables of means and Scheffé tests of significant differences between means, tabulated by group and by grade, are presented in the text where findings concerning particular variables are described.

Findings concerning the possible relationships between selected variables, representing portions of Ss' responses which aided them in their attempts to obtain word meaning from the context, are also reported in this chapter.

For experimental data not submitted to statistical treatment, presentation of the findings relative to how word meaning was obtained from context is supported by calculations based on percentages.

Use of Linguistic Information

The analysis of Ss' responses revealed that syntactic and semantic information was used in order to obtain the meaning of an unknown word deleted from the context. To what extent the responses revealed that this information was used in the process of obtaining word meaning is discussed in the following sections.

Use of Syntactic Information

Ss' responses indicated that knowledge of language structure seemed to help them obtain the familiar but unknown word deleted from the context. In particular, knowledge of the grammar by way of word form class was apparent, even though the correct word was not always elicited.

Word form class

The accuracy of word form class, dependent on the correct use of a noun, verb, adverb, or adjective to complete the context of sentence and paragraph items, was high. As shown in Table 6.1, of the test items completed, no errors were made by the Very Proficient

Table 6.1

Percentage Accuracy of Form Class and Percentage Omissions of Missing Word Responses to F. W. Tests - Sentences and Paragraphs

Grade	Reading Group	Sentences % Accuracy	 % Omits	Paragraphs % Accuracy	 % Omits
4	Very Proficient	100.00	7.50	98.31	1.67
	Proficient	98.13	10.83	93.10	3.33
	Less Proficient	95.13	10.83	98.11	11.67
6	Very Proficient	100.00	0.83	96.67	0.00
	Proficient	97.48	0.83	96.61	1.67
	Less Proficient	97.41	3.33	94.83	3.33
8	Very Proficient	100.00	1.67	95.00	0.00
	Proficient	100.00	.83	95.00	0.00
	Less Proficient	98.17	9.17	94.44	10.00

reading groups across the grades, in supplying the correct word form for sentence items. The percentage accuracy of the Proficient and Less Proficient reading groups in supplying the correct word from class was also high, ranging from 95.13 per cent to 98.17 per cent, although more items were omitted by these two groups than were omitted by the Very Proficient reading groups (grade 4 excepted).

The percentage accuracy of word form in paragraph items, ranging from 93.10 per cent to 98.31 per cent, tended to be slightly lower than for sentence items. It is possible that the structure of one paragraph (4B) was largely responsible for this discrepancy. The problem is discussed on page 159.

Ss' word response scores to the F. W. Tests - Sentences and Paragraphs were combined by word form class and by grade and submitted to a single factor experiment with repeated measures. (Winer, 1962, pp. 105-132). No significant differences were revealed between means at grade 4 level (F = 1.57; p = .23); at grade 6 level (F = 0.68; p = .42); or at grade 8 level (F = .41; p = .53). It may be noted (Table 6.2) that, although the differences between means of the four word form classes were not significant (i.e. word responses represented by nouns, verbs, adjectives, or adverbs), there was a tendency for grade 4 Ss to have more difficulty with test items in which the deleted word was an adverb or a verb as opposed to a noun or an adjective. It appeared, however, that for the fifty-four Ss in this study,

Table 6.2

Mean Scores by Word Form Class and by Grade: F-Ratios in Single Factor Experiments with Repeated Measures

Grade	Verb	Noun	Adj.	Adv.	F	Cons. Prob.
	Means					
4	64.41	67.46	67.46	62.85	1.57	0.23
6	70.49	73.02	73.61	69.97	0.68	0.42
8	81.42	80.95	82.14	79.34	0.41	0.53

difficulties encountered in obtaining word meaning from the context were not significantly related to a particular word form class. Since Ss' responses revealed that difficulties were encountered in completing the context of some test items, reasons other than word form class were sought.

Discussion of possible word form class problems

Although differences in mean word response scores by word form class were not significant, some Ss' responses revealed that word order created problems. For example, in sentences 6B and 3N, Ss were required to complete the context with an adverb placed before the main verb. In spite of the grammatical cue (-ly) being provided in sentence 3N, Ss tended to experience similar difficulties in both sentences; that is, some Ss seemed unable to consider the possibility of a word other than a noun or an auxiliary being placed before the main verb. The following examples of Ss' responses illustrate the type of difficulty encountered.

Examples: sentence 6B

Subject #12 - Smith. . . .

Subject #8 - had. Well, just like had left.

Subject #27 - had. Well, it's telling you that he "made his way" around the house . . . he had always made his way." It's the past tense, "Andrew had made his way."

Examples: sentence 3N

Subject #29 - had. Well, it's part of the sentence before the semicolon. I pretended it was a simple sentence and tried to find a word that would fit in there.

Subject #15 - had. 'Cause it'd go better with "left".

The most serious problem related to word order appeared to arise in paragraph 4B since more omissions were found for this item than for the remaining paragraph items combined. The sentence containing the blank was:

"---------were they warm or well-lighted."

Some Ss considered the sentence interrogative; other Ss discarded the notion when they concluded that no question mark was provided. Grade 4 Ss tended to supply the word *never* in their attempts to relate the sentence with the blank to the preceding sentences but failed, however, to note the significance of the expression "*most* castles". By contrast, older Ss tended to reject *never* largely because they reported an awareness of the significance of "most" in the expression "most castles" but seemed unable to think of a word to place in the initial position of the sentence.

Of the eight Ss who supplied an acceptable word response for paragraph 4B, one was from grade 4 (Very Proficient), two were from grade 6, and five were from grade 8, suggesting that some young Ss tended to demonstrate well-developed strategies for processing the context to complete its meaning, comparable to that of the older Ss.

Use of inflectional endings

Few errors were made in word responses requiring inflectional endings. As indicated by Table 6.3, only two errors in tense endings were not corrected by grade 4 Ss who made them in their first response to the test items. Similarly, in grade 6, two errors in tense were not self-corrected by the Ss; in grade 8, there was only one S who failed to correct his initial error in a tense ending.

In spite of the given -ed in sentence 10N, a limited number of Ss tended to complete the context with the word studying or working. For example, in justifying the use of working, Subject #10 stated, "Uh, well, they thought real deep when they were doing the science." And Subject #32 seemed to determine the meaning on a similar basis by explaining that "they were deeply in something and they would probably be working real hard at it." For these Ss, the major concern seemed to be directed toward the semantic information given or as interpreted by them rather than toward the inflectional ending (-ed) provided by the context.

Of interest were two responses to sentence 7N having the ending -ly attached to the given nonsense word. Subject #40, of the Very Proficient grade 8 reading group, elicited the word response "ravishly" stating, "I think that's what I want. Well, like the wolf hadn't eaten for several days so he was hungry and he tore the rabbit and devoured him so he had to do it ravishly."

A Less Proficient reader in grade 6, Subject #33, used the word gorgly. . "'cause he was in a hurry to devour the rabbit", indicating that the syntactic information provided seemed to be

Table 6.3

Frequency Inflectional Errors Corrected and Uncorrected
in F. W. Tests - Sentences and Paragraphs

	Corrected				Uncorrected			
	Verb		Adverb		Verb		Adverb	
Grade	Nons.	Blank	Nons.	Blank	Nons.	Blank	Nons.	Blank
4	1	1	2	0	1	1	0	0
6	0	2	0	0	2	0	1	0
8	0	3	0	0	0	1	1	0

utilized correctly. Furthermore, it is possible that the semantic information provided by the context was also understood by both these Ss who failed to elicit an acceptable word response either because they were attempting to select a word of "best fit" which could not be accurately called to mind (Subject #40, in particular) or they lacked the vocabulary to make an acceptable response possible, yet attempted to do so by guessing (Subject #33, perhaps).

It is also interesting that no inflectional errors were made in Ss' responses to test items having blanks (no inflectional endings provided) while four errors (two corrected) were made in word responses to nonsense test items (inflectional endings provided). The question may be raised as to the necessity of including inflectional endings when nonsense words are used in test items to represent a word missing from the context.

Use of function words

Ss varied in their ability to call to mind acceptable word responses for the five sentence items containing the six selected function words. Acceptable word responses for the five sentence items ranged from 30.00 per cent in grade 4, 47.78 per cent in grade 6, to 61.00 per cent in grade 8 (Table 6.4). While it was not possible to attribute the cause of success or failure to obtain word meaning directly to Ss' use or failure to use any or all of the six selected function words embedded in the five sentences, examination of Ss' responses provided some interesting information.

Table 6.4

Percentage Acceptable Word Responses in Sentence Items with Six Designated Function Words

	Sentence No.					
	7B	8B	9B	10B	9N	Total
Grade	"in" and "until" %	"with" %	"but" %	"in" %	"around" %	%
4	61.11	66.67	5.56	5.56	11.11	30.00
6	77.78	72.22	16.67	44.44	27.78	47.78
8	100.00	72.22	33.33	61.11	50.00	66.67

Responses to each of the five sentences were, therefore, discussed briefly.

Sentence 7B, containing the words in and until

Ss' responses revealed that the words in and until tended to be used in three ways: 1) use of one word but not the other; (2) use of both words; and (3) interchanged in the context, with only one word utilized. For example, grade 4 Ss tended to report use of "in the spring" more frequently than the use of until, probably because they were reluctant to "guess" the meaning of the word "foliate" (embedded in the context in order to obtain Ss' reactions to an unfamiliar word in a familiar context).

When Ss were asked what they thought the word foliate meant, there was a tendency to reply as in the following examples:
Subject #10 - The leaves start coming out.
Subject #13 - Until they grow in the spring.
Subject #15 - Until they get all their leaves back?
Of the eighteen Ss in each grade, slightly more than one half of the Ss in grades 6 and 8 reported use of both in and until when explaining how the word bare was obtained to complete the context; in grade 4, approximately one half reported use of in but only 4 Ss mentioned the word until while explaining their word choice.

Sentence 8B, containing the word with

The majority of Ss made reference to the expression "with necessary energy". Four Ss elicited the word response give and supported it by explaining that "sugar and starches give the body necessary energy" (*with* omitted). Poor word choice (e.g. *helps*, *fill*, *awards*) seemed to be the main problem with sentence 8B rather than failure to use the significant function word *with* as an aid to obtaining word meaning (i.e. "*supply* the body *with* necessary energy").

Sentence 9B, containing the word *but*

For the majority of Ss, sentence 9B was difficult. The percentage of acceptable word responses in grade 4 was 5.56 per cent; in grade 6, 16.67 per cent; and in grade 8, 33.33 per cent (Table 6.4). Ss tended to explain their responses in terms of "*and* sometimes" rather than the given "*but* sometimes." Whether this error was caused by failure to observe the word *but* or was the result of not knowing an appropriate word opposite in meaning to the expression "*but* sometimes" was not revealed by Ss' responses. It is suggested that the expression "*and* sometimes" was popular because Ss tended not to be able to call to mind the appropriate word opposite in meaning to the given Contrast-type meaning cue.

For example, *Subject #6* elicited the word response "sometimes" but indicated by his explanation that considerable meaning was obtained from the context. He stated, ". . . like sometimes they knew what to expect; well, they didn't know *all* the time what to expect, they just knew sometimes." Likewise, *Subject #30* supported the word "sometimes" with "because it says 'sometimes he was unpredictable' so they *sometimes* must know what he does and other times they don't."

Therefore, from the standpoint of word response, Ss in this study were not very successful in supplying the intended meaning, usually or generally. From the standpoint of a general understanding of the context, it would be erroneous to conclude that the Ss were not obtaining considerable meaning from it. It is possible that fewer errors might have been made in elicited word responses if the deleted word had been sometimes instead of the word usually.

Sentence 10B, containing the word in

Grade 8 Ss (61.66 per cent) and grade 6 Ss (44.44 per cent) tended to obtain more acceptable word responses to sentence 10B than did grade 4 Ss (5.56 per cent), as indicated in Table 6.4. Of the grade 4 Ss who revealed an awareness of the word in, only one S was able to elicit the intended word succeed. Subject #3, for example, suggested the word response "finish" but rejected it because "that in doesn't sound right." Her final word choice was "believe because you believe in a task."

Out of the fifty-four responses to sentence 10B, eighteen were completed by words such as finish or complete without reference to the expression "in whatever task." It is possible that older Ss tended to experience less difficulty with the test item because they were more familiar with the concept of success, or as stated bluntly by Subject #42, "I always get this criped at me at home"; that is, lack of experience with the concept of success and/or its connotations seemed to make it difficult for some Ss to contend with the expression following the blank; therefore, to "make sense" out of the context Ss may have ignored intentionally the preposition in.

Sentence 9N, containing the word around

Findings from Ss' responses seemed to suggest that the higher frequency of reference to the word around by grade 8 Ss and the Very Proficient grade 6 reading group might be attributed to background experience and knowledge about magnets, not yet attained by younger Ss. Concern for the action of the magnet itself rather than for the area "around the magnet" was suggested by the responses.

Ss in the Very Proficient grade 4 reading group and in the grade 6 reading groups attempted to refer to "around the magnet" in their explanations of the word response elicited, but limited knowledge about magnets seemed to hamper their efforts. The responses of grade 4 Ss tended to concentrate on attributes of magnets, such as, "they're made of steel" (Subject #15), "a magnet has force" (Subject #2) or "'cause a magnet usually has red around it" (Subject #5). Only one grade 4 S completed the context with the intended word area or space "around the magnet" and one S elicited the word "field" which, although considered a repetition, indicated that the S was getting the meaning conveyed by the function word around.

Summary: findings relative to selected function words

Ss' responses revealed that the six selected function words were aids in completing the meaning of the context in varying amounts and with varying degrees of success. It appeared that some Ss were limited in their use of these function words, for the most part, because they lacked adequate concepts of important words which were connected by a particular function word. The responses elicited from some Ss suggested that the experience and background of information brought to the reading situation seemed to have considerable influence upon the Ss' ability to use connectives as an aid to completing the meaning of the context.

Position of the word deleted from the context seemed also to have some bearing on the effectiveness with which function words were utilized by the Ss. If, for example, in sentence 9B, the word "sometimes" were deleted from the context instead of the first word "usually" (as was done in the test item), Ss' responses to that test item might have been quite different. Ss' explanations implied that considerable meaning was derived from the context in spite of inability of the majority to obtain an acceptable word response to complete the given context.

Use of Semantic Information

Findings relative to the use made of semantic information by Ss attempting to obtain word meaning from context are based on the Ss total responses to each test item (i.e. the three divisions of the response described in Chapter V). Therefore, the descriptions of the findings which follow are statistical and non-statistical, depending on the nature of the information.

Ability to control the language of the context: statistical description

Ss' elicited word responses, considered the product obtained from processing the context to complete its meaning, differed by group and by grade in quality and in quantity for sentence and paragraph items. Hence, findings concerning Ss' responses to sentence items are followed by a report of Ss' responses to paragraph items.

In sentences.

Results from the two-way analysis of variance revealed a signficant source of variance in the mean word response scores for the F. W. Tests - Sentences by groups (F = 19.07; p =.00).

When Scheffé tests were applied, a difference was revealed between the mean scores of the Very Proficient and the Proficient reading groups at the .01 level of significance, in favor of the Very Proficient reading groups (Table 6.5). Scheffé tests revealed also a difference between the mean scores of the Very Proficient and Less Proficient reading groups at the .001 level of significance, in favor of the Very Proficient reading groups. There was no significant difference between the mean word response scores of the Proficient and Less Proficient reading groups. Nevertheless, variability within these groups suggests that individuals within some groups tended to differ considerably in their ability to obtain word meaning from context. For example, as shown in Table 6.5, in the grade 4 Proficient reading group the amount of variance was 27.87 as compared to 6.70 for the Less Proficient reading group, suggesting that some Proficient readers tended to be more efficient in obtaining word meaning than others while the Less Proficient reading group tended to be more cohesive in their efforts to obtain word meaning. By contrast, in grade 6, where the amount of variance

Table 6.5

Mean Word Response Scores Familiar Words Tests - Sentences by Group and by Grade

Grade	Reading Group	Mean	Variance
4	Very Proficient	57.33	21.47
	Proficient	48.33	27.87
	Less Proficient	44.50	6.70
6	Very Proficient	61.67	54.67
	Proficient	55.67	42.27
	Less Proficient	50.17	67.77
8	Very Proficient	69.67	15.47
	Proficient	62.83	28.57
	Less Proficient	58.50	37.90

Significant Sources of Variance	Prob.
Group	.00**
Grade	.00**

There was no significant interaction between group and grade (p = .98)

Scheffé Test of Significance Between Groups

	Very Proficient	Proficient	Less Proficient
Very Proficient		.01**	.00***
Proficient			.07
Less Proficient			

Scheffé Test of Significance Between Grades

	4	6	8
4		.02*	.00***
6			.00
8			

*Significant at .05 level
**Significant at .01 level
***Significant at .001 level

was high as compared to the amount of variance calculated for grades 4 and 8, the word response scores of the Less Proficient reading group tended to vary (Variance = 67.77) considerably more than did the word response scores of the Proficient reading group (Variance = 42.27). Therefore, although the difference between mean word response scores of the Proficient and Less Proficient reading groups was not statistically significant, individual differences in word response scores within groups seemed to suggest that these differences may be important to an understanding of the processes used by developing readers to obtain word meaning from context.

Main effects due to grades were also revealed ($F = 24.97$; $p = .00$). Scheffé tests revealed a significant difference between the mean word response scores of grades 4 and 8 ($p < .001$) and between grades 6 and 8 ($p < .001$), both tests in favor of grade 8. Likewise, a difference was revealed between the mean word response scores of grades 4 and 6 at the .05 level of significance, in favor of grade 6 (Table 6.5).

Results of these tests seemed to suggest that, on the whole, the grade 6 Ss were significantly more mature in their ability to obtain word meaning from the context of sentence items than were the grade 4 Ss but their control of the language tended to remain closer to the level of grade 4 efficiency ($p < .05$) than to the level of grade 8 efficiency where the difference in mean scores was at the .001 level of significance. Moreover, the word response scores of grade 4 Ss indicated that the younger Ss seemed to have considerable control of the language as represented by their mean word response scores.

Later in this chapter, it will be seen that the grade 4 Ss tended to rely more heavily on words of "good fit" compared to words of "best fit" used more frequently by older Ss which, of course, was reflected in the mean word response scores by group and by grade.

It has been shown that the Very Proficient reading groups were significantly more efficient in obtaining word meaning from context than were the Proficient and Less Proficient reading groups. In view of the significantly higher mean IQ scores (Chapter III, Table 3.4) and significantly higher criterion mean vocabulary scores (Chapter III, Table 3.2) of the Very Proficient reading groups across the grades as compared to those of the Proficient and Less Proficient reading groups, greater efficiency in processing word meaning from context was not surprising.

In paragraphs

Results from the two-way analysis of variance (Table 6.6) revealed significant differences in mean word responses to F. W. Tests - Paragraphs due to groups ($F = 12.71$; $p = .00$) and to grades ($F = 10.64$; $p = .00$).

Scheffé tests of differences revealed a significant difference between the mean word responses of the Very Proficient and the Proficient reading groups ($p < .05$) and between the Very Proficient and Less Proficient reading groups ($p < .001$), both in favor of the Very Proficient reading groups. There was no significant difference between the mean word response scores of the Proficient and Less Proficient reading groups.

Table 6.6

Mean Scores Familiar Words Tests - Paragraphs
by Group and by Grade

Grade	Reading Group	Mean	Variance
4	Very Proficient	32.50	6.70
	Proficient	26.33	28.27
	Less Proficient	24.83	14.96
6	Very Proficient	33.50	11.50
	Proficient	29.33	8.67
	Less Proficient	27.83	30.16
8	Very Proficient	35.67	1.87
	Proficient	34.50	5.50
	Less Proficient	30.50	15.90

Significant Sources of Variance	Prob.
Group	.00***
Grade	.00***

There was no significant interaction between group and grade (p = .57)

Scheffé Test of Significance Between Groups

	Very Proficient	Proficient	Less Proficient
Very Proficient		.01**	.00***
Proficient			.18
Less Proficient			

Scheffé Test of Significance Between Grades

	4	6	8
4		.18	.00***
6			.04*
8			

*Significant at .05 level

**Significant at .01 level

***Significant at .001 level

While the difference in mean word response scores of the Less Proficient reading groups for paragraphs was not significantly lower than was the mean word response scores of the Proficient reading groups, the results merit close examination. The reading potential of the Less Proficient reading group, determined by the criterion mean vocabulary scores on the standardized reading test (C.T.B.S.) reported in Chapter III (Table 3.2), was not significantly different from the mean vocabulary scores of the Proficient reading group. The lower mean scores of the Less Proficient reading groups on the F. W. Tests - Sentences and Paragraphs, seemed to suggest that they were less efficient in obtaining word meaning from context than they might be, in view of their reading potential.

Scheffé tests of differences revealed also that the mean word response scores for paragraph were significantly higher for grade 8 Ss than they were for grade 6 Ss ($p < .05$) and for grade 4 Ss ($p < .001$).

Although there was no significant difference between the mean word response scores of grades 4 and 6, there was a tendency for the grade 6 Ss to obtain higher mean scores than the grade 4 Ss. These findings seemed to suggest that the more mature grade 6 Ss may be moving toward increased use of precise word meaning (Level 1 word responses) but their control of the language was not yet equal to the level of efficiency of grade 8 Ss. At the same time, grade 4 Ss seemed to have considerable control of the language as represented by their mean scores. For paragraphs, it may also be seen that the grade 4 Ss tended to rely more heavily on words of "good fit" (Level 2 word responses) which also seemed to indicate that their language power was developing and that, in turn, tended to influence their processing (reading) power to obtain word meaning from context.

Quality of language control in relation to sentence type

Since there were only four sentence test items and two paragraph test items for each of the five selected of embedded contextual clues, Ss' word response scores were combined for each type of contextual clue to permit statistical treatment of the data.

Results of the two way-analyses of variance (Table 6.7) revealed significant main effects due to groups for each of the five selected sentence types. Scheffé tests of differences revealed significant differences between the mean word responses of the Very Proficient and the Less Proficient reading groups, in favor of the Very Proficient reading groups for all five sentence types. Significant differences between the mean word response scores of the Very Proficient and Proficient reading groups were revealed for three sentence types (Syn.: $p < .01$; D/D: $p < .05$; Con.: $p < .001$), all in favor of the Very Proficient reading groups.

The Less Proficient reading groups seemed to experience more difficulty processing word meaning from the context than did the Proficient reading groups. The differences, however, were statistically significant for only two sentence types; that is, for L/E ($p < .001$) and for C/E ($p < .01$) the mean word response scores of the Proficient reading groups were significantly higher than were

Table 6.7

F-Ratios for Main Effect (Including Scheffé Tests of Differences) Due to Group and Grade from the Two-Way Analyses of Variance on Five Types of Contextual Clues in F. W. Tests - Sentences and Paragraphs

Type Contextual Clue	BETWEEN GROUPS					BETWEEN GRADES				
	Two-Way Analyses of Variance		Scheffé Tests			Two-Way Analyses of Variance		Scheffé Tests		
	F-Ratio	Prob.	V.P. and P.	V.P. and L.P.	P. and L.P.	F-Ratio	Prob.	4 and 6	4 and 8	6 and 8
L/E	8.35	.00***	.99	.00***	.00***	5.88	.01**	.58	.00***	.08
Syn.	9.37	.00***	.01**	.00***	.63	5.66	.01**	.35	.01**	.18
C/E	15.96	.00***	.10	.00***	.01**	16.28	.00***	.01**	.00***	.08
D/D	6.20	.00***	.05*	.01**	.69	11.67	.00***	.26	.00***	.01**
Contrast	8.46	.00***	.00***	.01**	.97	11.63	.00***	.24	.00***	.01**

*Significant at .05 level
**Significant at .01 level
***Significant at .001 level

those of the Less Proficient reading groups.

Main effects due to grades were revealed for each sentence type. Scheffé tests revealed significant differences between the mean word response scores of grade 4 Ss and grade 8 Ss for each sentence type, in favor of the grade 8 Ss. Grade 6 mean word response scores were significantly higher than were the grade 4 mean word response scores for only one sentence type, C/E ($p < .01$); grade 6 mean word response scores were significantly lower than were the grade 8 mean word response scores for only two sentence types; namely, D/D ($p < .01$) and Contrast ($p < .01$).

These findings seemed to indicate that the grade 6 Ss might have been in a state of transition with respect to dealing with abstract verbal operations. In some instances, there was a tendency for the grade 6 Ss to obtain precision in word meaning which was reaching the level of maturity expressed by the older grade 8 Ss in their word responses; at other times, the grade 6 Ss' word responses were not significantly superior to the less precise word responses of the grade 4 Ss.

Difference in language control by grade and by sentence type

To determine whether Ss at each grade level found one sentence type (based on embedded contextual clue) more difficult than any other in relation to the number of acceptable word responses elicited, the Ss' word response scores were submitted to a single factor experiment with repeated measures (Winer, 1962, pp. 105-24). A significant difference due to sentence type was revealed: for grade 4 (F = 17.60; p = .00); for grade 6 (F = 19.05; p = .00) and for grade 8 (F = 9.88; p = .01). (Appendix H)

The mean word response scores by grade for each sentence type (sentences and paragraphs) are shown in Table 6.8. By inspection, it was decided that the L/E mean word response scores were significantly higher than the mean word response scores of the four remaining sentence types (Synonym, C/E, D/D, and Contrast) at each grade ~~level~~ (grades 4, 6, and 8).

There was a tendency across the grades for Ss to find the Contrast sentence types the most difficult, as indicated by the lowest mean word response scores (Table 6.8). On the other hand, Ss across the grades tended to achieve the highest scores for L/E sentence types, followed by C/E, D/D, and Synonym sentence types. Only for L/E sentence types was the difference in mean word response scores significantly higher, thereby suggesting that the Ss experienced the least difficulty in obtaining the meaning of the familiar word deleted from the context of sentences simply structured from words and concepts meaningful to them.

Quality of language control: sentences versus paragraphs

During the personal interviews an observation made was that Ss seemed to respond to paragraph items more readily than to sentence items. To make statistical comparisons possible, Ss' mean word response scores to the twenty sentence items and to the ten paragraph items were converted to percentages.

Results from the correlated t tests (Table 6.9) revealed a

Table 6.8

Mean Word Response Scores by Grades for Five Selected Types of Embedded Contextual Clues in F. W. Tests - Sentences and Paragraphs

Type: Embedded Contextual Clue	Grade 4	Grade 6	Grade 8
	Mean	Mean	Mean
L/E	20.56	20.83	22.56
Syn.	14.17	15.94	18.22
C/E	15.22	17.83	19.67
D/D	15.11	16.39	18.78
Contrast	13.39	15.06	18.00

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Table 6.9

Correlated t Tests: Word Response Scores F. W. Tests - Sentences and Paragraphs

	Sentences		Paragraphs		t	p
Grade	$\overline{X}^a$	S.D.	$\overline{X}^a$	S.D.		
4	62.57	8.34	69.72	12.47	-3.44	.00***
6	69.79	10.29	75.56	11.10	-2.84	.01**
8	79.58	8.28	83.89	8.43	-3.81	.00***

** Significant at .01 level
*** Significant at .001 level
[a] Expressed as percentages

significant difference between the mean word response scores of sentence and paragraph items for grade 4 ($t = -3.44$) and for grade 8 ($t = -3.81$) at the .001 level of significance, in favor of paragraph items. For grade 6 ($t = -2.84$) the difference between mean word response scores was significant at the .01 level, also in favor of paragraph items. It appeared that Ss across the grades were more successful in processing word meaning from paragraphs than from sentences.

Findings relative to Ss' reported processing "time" for sentence and paragraph items, reported later in this chapter, provided additional information concerning the comparative ease of reading sentence and paragraph items and subsequent success in obtaining word meaning to complete the context.

Quality of language control: blanks versus nonsense words

Results from correlated t tests revealed no significant difference between Ss' word response scores whether the deleted word was replaced by a blank or a word in sentences or in paragraphs (Table 6.10). The mean word response scores of grade 8 Ss for paragraph items ($t = .00$; $p = 1.00$), nonsense or blank, were the same ($\overline{X} = 16.78$). Grade 4 Ss tended to obtain slightly higher mean scores for test items with nonsense words ($\overline{X} = 14.17$) than for blank test items ($\overline{X} = 13.72$) but the differences were not significant ($t = -0.87$; $p = .40$). By contrast, grade 6 Ss' mean word response scores for blank test items ($\overline{X} = 15.33$) tended to be slightly higher than were the mean scores for nonsense words ($\overline{X} = 14.89$), yet the differences

Table 6.10

Correlated t Tests: Word Response Scores to F. W. Tests - Sentences and Paragraphs, Blanks and Nonsense

Grade	Sentences						Paragraphs					
	Blanks		Nonsense				Blanks		Nonsense			
	$\overline{X}$	S.D.	$\overline{X}$	S.D.	t	Prob.[a]	$\overline{X}$	S.D.	$\overline{X}$	S.D.	t	Prob.[a]
4	24.11	3.60	25.94	4.78	-1.45	.17	13.72	3.02	14.17	2.37	-0.87	.40
6	27.89	3.69	27.94	5.47	-0.05	.96	15.33	1.98	14.89	2.79	0.97	.35
8	31.11	4.21	32.56	3.49	-1.35	.19	16.78	1.90	16.78	2.25	0.00	1.00

[a] There were no significant differences at .05 level

were not significant (t = .97; p = .35).

There were no significant differences between mean scores for blank and for nonsense sentence test items in grade 4 (t = -1.45; p = .17), in grade 6 (t = -.05; p = .96), or in grade 8 (t = -1.35; p = .19). There was, however, a tendency for the mean word response scores for nonsense test items to be somewhat higher than for blank test items (Table 6.10).

Ss' reported preferences: blanks or nonsense words

No statistically significant difference was revealed between Ss' mean word response scores of test items whether the word deleted from the context was represented by a blank or a nonsense word. Similarly, from Ss' reported preference, there appeared to be no marked differences of opinion. Of the 49 Ss (out of 54) stating a preference, 29 Ss (59.18 per cent) preferred blanks to nonsense words. Trends in Ss' opinions concerning the use of nonsense words, instead of the usual blanks, to replace the word deleted from the context are represented by the following statements made by Ss when asked to give reasons for their preference, blanks or nonsense words:

Pro: Nonsense Words	Against: Nonsense Words
"Kinda helped me with the word. There wasn't a space and it gave me an idea."	"You just see a blank and put something in there."
"Helped me more with the letters and stuff. The letters didn't mean anything, the endings did."	"Made me think of words that looked like that or started with the same letter: slowed me down."
"It helped me get words I don't use very often. Helped me think of other letters."	"Sorta got a little mixed up. It took me a few moments to realize it was meaningless and go on."

"I'd try to figure a word out of it."

"It doesn't look right with just a blank."

"Kinda harder. Funner too. Blanks, I have to use them all the time."

"'Cause they were more fun."

"Sort of confuses you."

"Blanks a bit easier."

"Kinda threw me off."

"Blanks better -- slows you down."

Summary: blanks versus nonsense words

1. Older Ss tended to favor blanks; younger Ss were more open to nonsense words, considering them a challenge ("more fun").

2. In spite of efforts to construct nonsense words bearing no resemblance to real words, Ss' comments seemed to indicate that the efforts were not entirely successful in that some Ss reported trying to relate the letters in the nonsense word to the real word.

3. From Ss' comments and by observations of the investigator, it appeared that nonsense words tended to "slow down" some Ss when first faced with the unusual situation of having nonsense words instead of blanks when a word was deleted from the context. However, test results revealed no significant difference between Ss' mean scores for the nonsense and blank subtests of the F. W. Tests - Sentences and Paragraphs.

Control of the language: qualitative levels of word responses

Statistical analysis of Ss' word responses revealed significant differences between mean word response scores by groups and by grade in terms of qualitative measurement of word responses. These results, however, provided no specific information concerning Ss' ability to obtain the intended meaning of the word missing from the context as opposed to an acceptable word of "good fit", a meaning acceptable to the S but not intended by the context, or to elicit a bizarre response or none at all. Therefore, results from an analysis of Ss' word responses to determine the proportion of word responses at each of the four qualitative levels was presented in order to provide additional information concerning Ss' ability to control the quality of words elicited to complete the meaning of verbal context.

In sentences

As shown in Table 6.11, the Very Proficient reading groups elicited a higher proportion of mature, precise (Level 1) word responses and a lower proportion of bizarre (Level 4) word responses than did the Proficient and Less Proficient reading groups. In grade 4, 45.00 per cent of the Very Proficient reading groups' word responses were placed in Level 1 and only 17.50 per cent were considered Level 4 word responses. For the Proficient reading group, 30.00 per cent of Ss' word responses were placed in Level 1 and 36.67 per cent were placed in Level 4. For the Less Proficient reading group, only 23.33 per cent of the word responses were considered Level 1 in quality while 40.83 per cent of the word responses were considered unacceptable in quality, Level 4. That is, for the Proficient and Less Proficient reading groups, the proportion of bizarre or no responses (Level 4) exceeded the proportion of precise, mature word responses (Level 1) while Ss in the

Very Proficient reading group elicited a higher proportion of Level 1 word responses than Level 4 word fesponses.

In grades 6 and 8, the proportion of Level 1 word responses tended to be higher and the proportions of Level 4 word responses tended to be lower than was determined for grade 4. Nevertheless, similar patterns of differences seemed to prevail. For example, in the Very Proficient grade 8 reading group, the proportion of Level 1 word responses was 70.83 per cent and the proportion of Level 4 word responses was only 8.33 per cent. For the Proficient grade 8 reading group, 52.50 per cent of the word responses were placed in Level 1 and 10.00 per cent in Level 4. Of the word responses from the Less Proficient grade 8 reading group, only 46.67 per cent were placed in Level 1. The proportion of Level 4 word responses was considerably higher (24.17 per cent) than was the proportion of Level 4 word responses for the other two grade 8 reading groups.

The proportion of Level 2 word responses, by group and by grade, was fairly consistent. It appeared that Ss in grade 4 (16.66 per cent), in grade 6 (18.05 per cent), and in grade 8 (17.22 per cent) were able to elicit word responses of "good fit" (i.e. Level 2) with comparable skill.

Considering the quality (level) of Ss' word responses by grades, slightly more than one half (56.67 per cent) of the grade 8 word responses represented mature, precise language (Level 1) intended to complete the meaning of the context. Grade 6 Ss elicited Level 1 word responses for 40.56 per cent of the sentence items; grade 4 used well-controlled word responses (Level 1) for approximately

Table 6.11

Percentages: Word Responses to F. W. Tests - Sentences (N = 20) by Qualitative Levels, by Group, and by Grade

Gr.	Reading Group	Level 1[a] Total No.	Level 1[a] Per Cent	Level 1[a] Per Cent Range	Level 2[b] Total No.	Level 2[b] Per Cent	Level 2[b] Per Cent Range	Level 3[c] Total No.	Level 3[c] Per Cent	Level 3[c] Per Cent Range	Level 4[d] Total No.	Level 4[d] Per Cent	Level 4[d] Per Cent Range
4	Very Proficient	54	45.00	35-60	17	14.17	10-20	28	23.33	10-35	21	17.50	15-20
	Proficient	36	30.00	20-40	22	18.33	10-25	18	15.00	10-20	44	36.67	20-50
	Less Proficient	28	23.33	20-30	21	17.50	10-30	22	18.33	0-30	49	40.83	30-55
	Total	118	32.78	20-60	60	16.66	10-30	68	18.89	0-35	114	31.67	15-55
6	Very Proficient	58	48.33	30-65	24	20.00	10-35	28	23.33	15-30	10	8.33	0-25
	Proficient	48	40.00	25-70	23	19.17	5-30	24	20.00	10-30	25	20.83	5-30
	Less Proficient	40	33.33	25-50	18	15.00	5-25	25	20.83	10-30	37	30.83	5-50
	Total	146	40.56	25-70	65	18.05	5-30	77	21.39	0-35	72	20.00	0-50
8	Very Proficient	85	70.83	50-80	17	14.17	5-30	8	6.67	5-10	10	8.33	0-15
	Proficient	63	52.50	45-60	25	20.83	10-35	20	16.67	10-25	12	10.00	0-30
	Less Proficient	56	46.67	30-65	20	16.67	10-25	15	12.50	5-20	29	24.17	5-45
	Total	204	56.67	30-80	62	17.22	5-35	43	11.94	5-25	51	14.17	0-45

[a] mature, precise words of "best fit"
[b] words of "good fit"
[c] unacceptable but bearing some meaning
[d] bizarre or no response

one-third of the sentence items (32.78 per cent).

In addition, the following tendencies were revealed by calculating the proportion of Ss' word responses according to quality of the language in terms of levels:

1. In grade 4, the proportion of bizarre (Level 4) word responses (31.67 per cent) was approximately the same as the proportion of precise, mature (Level 1) word responses (32.78 per cent). In grade 6, the proportion of Level 4 word responses (20.00 per cent) was lower than was the proportion of Level 1 word responses (40.56 per cent). In grade 8, the proportion of Level 4 word responses (14.17 per cent) was considerably lower than was the proportion of Level 1 word responses (56.67 per cent).

2. In grade 8, the proportion of Level 3 word responses (unacceptable to complete the meaning of the context but not unacceptable to complete the Ss' interpreted meaning) was considerably lower (11.94 per cent) than was the proportion of Level 3 word responses elicited by grade 6 Ss (21.39 per cent) and by grade 4 Ss (18.89 per cent).

3. The percentage range of elicited word responses tended to overlap by groups within each grade and at each level of word response. For example, in grade 8, the proportion of Level 1 word responses ranged from 30 to 80 per cent. The range of Level 1 word responses for the Proficient reading group (45 to 60 per cent) and for the Less Proficient reading group (30 to 65 per cent) indicated that some Ss within these two groups tended to elicit Level 1 word responses as frequently as did some Ss in the Very Proficient reading group where

the proportion of Level 1 word responses ranged from 50 to 80 per cent. Similar tendencies (Table 6.11) may be seen by examination of the percentage range for the three remaining levels.

In paragraphs

The Very Proficient reading groups across the grades tended to elicit a greater proportion of Level 1 word responses for paragraph items than did the Proficient and Less Proficient reading groups (Table 6.12). For example, in grade 6, for the Very Proficient reading group, 58.33 per cent of the word responses were placed in Level 1 as compared to 45.00 per cent of word responses from the Proficient reading group and 33.33 per cent from the Less Proficient reading group.

Findings similar to those for Level 4 word responses to sentence items were revealed for Level 4 word responses to paragraph items; that is, the proportion of Level 4 word responses tended to increase by group (Very Proficient to Less Proficient) and decrease by grade (grades 4 to 8). As shown in Table 6.12, the Very Proficient reading groups tended to elicit few Level 4 word responses (5.00 per cent in grade 4; 3.33 per cent in grade 6; and 1.67 per cent in grade 8). By contrast, the Less Proficient reading groups tended to elicit a higher proportion of Level 4 word responses than did the other two reading groups (26.67 per cent in grade 4; 18.33 per cent in grade 6; and 16.67 per cent in grade 8).

The proportion of Level 2 word responses to paragraph items varied somewhat by group and by grade. In grade 4, 28.89 per cent,

Table 6.12

Percentages: Word Responses to F. W. Tests - Paragraphs (N = 10) by Qualitative Levels, by Group, and by Grade

		Level 1[a]			Level 2[b]			Level 3[c]			Level 4[d]		
Gr.	Reading Group	Total No.	Per Cent	Per Cent Range	Total No.	Per Cent	Per Cent Range	Total No.	Per Cent	Per Cent Range	Total No.	Per Cent	Per Cent Range
4	Very Proficient	29	48.33	30-70	20	33.33	20-40	8	13.33	10-20	3	5.00	0-10
	Proficient	18	30.00	20-60	14	23.33	10-50	14	23.33	10-50	14	23.33	10-60
	Less Proficient	14	23.33	10-40	18	30.00	10-50	12	18.33	0-40	16	26.67	10-50
	Total	61	33.89	10-70	52	28.89	10-50	36	18.89	0-50	33	18.33	0-60
6	Very Proficient	35	58.33	40-90	12	20.00	0-40	11	18.33	10-40	2	3.33	10-40
	Proficient	27	45.00	30-70	11	18.33	10-30	13	21.67	10-30	9	15.00	10-30
	Less Proficient	20	33.33	10-60	19	31.67	20-40	10	16.67	10-20	11	18.33	10-20
	Total	82	45.56	10-90	42	23.33	0-40	34	18.89	10-40	22	12.22	10-40
8	Very Proficient	41	68.33	50-90	13	21.67	0-50	5	8.33	0-30	1	1.67	0-10
	Proficient	38	63.33	40-80	12	20.00	0-30	10	16.67	0-30	0	0.00	0- 0
	Less Proficient	30	50.00	30-70	11	18.33	0-30	9	15.00	10-30	10	16.67	10-40
	Total	109	60.56	30-90	36	20.00	0-50	24	13.33	0-30	11	6.11	0-40

[a] mature, precise words of "best fit"
[b] words of "good fit"
[c] unacceptable word but bearing some meaning
[d] bizarre or no response

in grade 6, 23.33 per cent, and in grade 8, 20.00 per cent of the word responses were considered acceptable word responses in that they "fit" the context (Level 2) but lacked the mature, "best fit" of Level 1 word responses. The variability within the Proficient and Less Proficient reading groups is interesting. In grade 4, the proportion of elicited word responses (Level 2) to paragraph items for the Proficient reading group was 23.33 per cent and for the Less Proficient reading group was 30.00 per cent. By contrast, the proportion of Level 1 word responses was 30.00 per cent for the Proficient and 23.33 per cent for the Less Proficient reading group. While the total number of acceptable (Levels 1 and 2 combined) word responses was the same for the two groups, the Proficient reading group tended to use a larger proportion of mature, precise (Level 1) word responses, suggesting greater control of the language than was demonstrated by the Less Proficient reading group. A similar tendency prevailed at the grade 6 level.

It is interesting to note the percentage range of word responses to paragraph items at each of the four qualitative levels within each grade. In grade 4, for example, the proportion of Ss' Level 1 word responses ranged from 10 to 70 per cent; the percentage range of Level 4 (grade 4) word responses was equally diverse (0 to 60 per cent). Even within the Very Proficient reading group, where the proportion of acceptable word responses tended to be high, variance was considerable. In grade 6, for example, for the Very Proficient reading group, the percentage range of Level 1 word responses was from 40 to 90 per cent; Level 2 word responses ranged from 0 to 40 per cent; Levels 3 and 4 ranged from 10 to 40 per cent; that is, Ss in this study, regardless of reading group or grade level, tended to vary somewhat in their ability to elicit mature, precise words of "best fit" to complete the meaning of paragraph items.

Acceptable word responses: sentences and paragraphs

Considering word responses placed in Levels 1 or 2 as being acceptable or correct (i.e. either a "best fit" or a "good fit") to complete the context, the proportion of Ss' acceptable word responses to test items (sentences and paragraphs) was calculated by grade. Grade 4 Ss completed the context with acceptable word responses to 49.44 per cent of the sentence items (Table 6.13). For 58.61 per cent of the sentence items, grade 6 Ss elicited acceptable word responses. Grade 8 Ss completed the context of 73.89 per cent of the sentence items with acceptable word responses. Moreover, at each grade level, there was a tendency for the Very Proficient reading groups to obtain a higher proportion of acceptable word responses than did the Proficient or Less Proficient reading groups. Similarly, the Proficient reading groups tended to obtain a higher proportion of acceptable word responses than did the Less Proficient reading groups. For example, in grade 8, the percentages acceptable word responses by groups were: Very Proficient, 85.00 per cent; Proficient, 73.33 per cent; and Less Proficient, 63.34 per cent.

Table 6.14 shows the proportion of acceptable word responses for paragraph items by group and by grade. The proportion of

Table 6.13

Percentage Correct or Acceptable Missing Word Responses to F. W. Tests - Sentences

Grade	Very Proficient	Reading Group Proficient	Less Proficient	Total Group
4	59.17	48.33	40.83	49.44
6	68.33	59.17	48.33	58.61
8	85.00	73.33	63.34	73.89

Table 6.14

Percentage Correct or Acceptable Missing Word Responses to F. W. Tests - Paragraphs

Grade	Very Proficient	Reading Group Proficient	Less Proficient	Total Group
4	81.66	53.33	53.33	62.78
6	78.33	63.33	65.00	68.89
8	90.00	83.33	68.33	80.56

acceptable word responses in grade 4 was 62.78 per cent; in grade 6, 68.89 per cent; and in grade 8, 80.56 per cent. There was a tendency for the Very Proficient reading groups across the grades to obtain a higher proportion of acceptable word responses than did the Proficient or Less Proficient reading groups. For example, in grade 8, the proportion of acceptable word responses by groups was: Very Proficient, 90.00 per cent; Proficient, 83.33 per cent; and Less Proficient, 68.33 per cent. In grade 4, there was no difference in the proportion of acceptable word responses by Proficient and Less Proficient reading groups (53.33 per cent for each); in grade 6, the differences were small (Proficient, 63.33 per cent; Less Proficient, 65.00 per cent). It is possible that in paragraphs, where the information tended to be less compact than in sentence items, the Less Proficient were able to obtain word meaning as efficiently as did the Proficient reading groups. It is also possible that results for the grade 8 Less Proficient reading group were influenced by one S who tended to be confused by a larger context (the paragraph in contrast to the sentence).

Summary: control of language in word responses, sentences and paragraphs

A report of the proportion of word responses to sentence and paragraph items is presented in Table 6.15. By inspection, the following observations were made:

1. For both sentences and paragraphs, a larger proportion of Ss' word responses were placed in Level 1 than in any of the three remaining qualitative levels. The proportion of these precise,

Table 6.15

Percentages Word Responses to F. W. Tests - Sentences and Paragraphs by Qualitative Levels and by Grade

	Grade 4		Grade 6		Grade 8	
Level	Sentences	Paragraphs	Sentences	Paragraphs	Sentences	Paragraphs
1	32.78	33.89	40.56	45.56	56.67	60.56
2	16.67	28.89	18.06	23.33	17.22	20.00
3	18.89	18.33	21.39	18.89	11.94	13.33
4	31.67	18.89	20.00	12.22	14.17	6.11

mature (Level 1) word responses for sentences and for paragraphs was highest in grade 8 and lowest in grade 4. The proportion of grade 6 word responses tended to be lower than was the grade 8's but higher than was grade 4's proportion of Level 1 word responses.

2. The proportion of Level 1 word responses in grade 4 was comparable for sentences (32.78 per cent) and for paragraphs (33.89 per cent). There was a tendency for Ss in grades 6 and 8 to obtain a higher proportion of mature, precise (Level 1) word responses for paragraphs (45.56 per cent, grade 6; 60.56 per cent, grade 8) than was achieved for sentences (40.56 per cent, grade 6; and 56.67 per cent, grade 8).

3. The proportion of Level 2 word responses, representing words acceptable to complete the context but lacking the precision of Level 1 word responses, appeared to remain fairly constant across the grades for sentences (for approximately 16 to 18 per cent of the word responses). While the proportion of Level 2 word responses tended to be slightly higher in grades 6 and 8 for paragraphs than for sentences, in grade 4 there was a considerably higher proportion for paragraphs (28.89 per cent) than for sentences (16.67 per cent). It is possible that grade 4 Ss were able to obtain more acceptable word responses for paragraphs than for sentences but not with the same increase in the quality of the control of the language (Level 1) as was demonstrated by Ss in grades 6 and 8.

4. The proportion of Level 4 word responses (bizarre or no response) was considerably lower across the grades for paragraphs than for sentences, suggesting that the Ss seemed to "make sense" of the

context of paragraphs more efficiently.

5. The proportion of Ss' word responses placed in Level 3, for both sentences and paragraph items, tended to vary only slightly. That is, whether the context was in the form of a sentence or a paragraph, there were times when Ss failed to complete the context with the intended word meaning, but managed to interpret the context so as to provide an unacceptable (but not bizarre) word to complete the sentence or paragraph.

Use of meaning cues to obtain word meaning from context

As a result of submitting quantitative measures of Ss' reported meaning cues to two-way analyses of variance, main effects due to group and to grade were revealed for sentences and for paragraphs. Hence, each will be reported, in turn.

In sentences

A significant source of variance on the variable, meaning cues, was revealed by group ($F = 4.46$; $p = .02$). Scheffé tests of differences between means revealed a significant difference between the mean number of meaning cues used by the Very Proficient and the Less Proficient reading groups in favor of the Very Proficient reading group (Table 6.16), at the .05 level of significance. There was no significant difference between the mean number of meaning cues used by the Very Proficient and Proficient reading groups.

It was reported in the previous section that the mean word response scores of the Very Proficient reading groups were significantly higher than were the mean word response scores of either the

Table 6.16

Mean Number Meaning Cues in Ss' Elicited Responses to F. W. Tests - Sentences

Grade	Reading Group	Sentences Mean	 Variance
4	Very Proficient	52.17	44.17
	Proficient	42.67	107.06
	Less Proficient	44.50	58.30
6	Very Proficient	61.67	75.07
	Proficient	51.17	10.97
	Less Proficient	52.17	9.77
8	Very Proficient	53.50	80.57
	Proficient	53.50	55.10
	Less Proficient	47.50	196.30

Significant Source of Variance	P
Group	.02*
Grade	.01**

There was no significant interaction between group and grade (p = .55)

Scheffé Test of Significance Between Groups

	Very Proficient	Proficient	Less Proficient
Very Proficient		.07	.03*
Proficient			.93
Less Proficient			

Scheffé Test of Significance Between Grades

	4	6	8
4		.01**	.21
6			.47
8			

*Significant at .05 level
**Significant at .01 level

Proficient or Less Proficient reading groups. In the previous paragraph it was also reported that the Very Proficient reading group used a significantly higher mean number of meaning cues than was used by the Less Proficient group, suggesting a possible relationship between the number of meaning cues used and success in obtaining meaning from the context. However, although there was not a significant difference in the mean number of meaning cues used by the Proficient and Very Proficient reading groups, there was a significant difference between the mean word response scores of the two groups, in favor of the Very Proficient reading group. It seemed, therefore, that the Proficient reading group tended to analyze the sentences as effectively as did the Very Proficient reading group in order to obtain the meaning cues, but they tended not to synthesize the information as effectively (indicated by lower mean word response scores) as did the Very Proficient reading group.

Grade 6 Ss used a significantly greater number of meaning cues ($p < .05$) than did the grade 4 Ss. They tended also to use more meaning cues than did grade 8 Ss although the difference was not statistically significant.

Therefore, although the mean number of meaning cues used by Ss in grades 4 and 8 and grades 6 and 8 was not significantly different, the mean word response scores were significantly different (Table 6.5, p. 170) across the grades. It seems probable that factors other than the number of meaning cues used influenced the Ss' success in obtaining the word deleted from the context. It might be considered that the grade 4 Ss perceived the meaning cues as effectively as did the grade 8 Ss; they appeared less able, however, to relate essential ideas revealed by the meaning cues in order to generalize and obtain word meaning from the context with the same degree of success as did the older Ss in grades 6 and 8.

The significantly larger number of meaning cues used by Ss in grade 6 than by Ss in grade 4 might be attributed to their stage of development which made it possible for them to abstract the essential meaning cues with greater efficiency than did the grade 4 Ss. By comparison with grade 8, however, it appeared that, although the grade 6 Ss tended to abstract the meaning cues with increasing skill, they were less efficient in the use of the meaning cues (i.e. less able to generalize from them) than were the grade 8 Ss whose word response scores were significantly higher ($p < .001$; Table 6.5, p. 170).

In paragraphs

Results from the two-way analysis of variance revealed a significant difference in groups ($F = 4.75$; $p = .01$) (Table 6.17). Scheffé tests revealed a significant difference between the mean number of meaning cues used by the Very Proficient and Less Proficient reading groups (a difference similar to that reported for sentence items), in favor of the Very Proficient reading group ($p < .05$). There was no significant difference between the mean number of meaning cues used by the Very Proficient and Proficient or the Proficient and Less Proficient reading groups.

There were no significant main effects due to grades ($F = 1.37$;

Table 6.17

Mean Number Meaning Cues in Elicited Responses to Familiar Words Tests - Paragraphs

Grade	Reading Group	Paragraphs Mean	Variance
4	Very Proficient	26.33	15.07
	Proficient	21.83	13.77
	Less Proficient	22.33	36.67
6	Very Proficient	29.83	24.57
	Proficient	23.33	13.07
	Less Proficient	25.00	24.80
8	Very Proficient	29.33	32.27
	Proficient	27.00	25.60
	Less Proficient	22.33	88.67

Significant Source of Variance	p
Group	.01**
Grade	.26

There was no interaction between group and grade (p = .67)

Scheffé Tests of Significance Between Groups

	Very Proficient	Proficient	Less Proficient
Very Proficient		.06	.02*
Proficient			.90
Less Proficient			

$*p < .05$
$**p < .01$

p = .26). As indicated by Table 6.17, however, variance within the groups by grade was considerable.

Inspection of means revealed a tendency for grade 6 Ss to make greater use of meaning cues than did grade 4 Ss. Similarly, grade 6 Ss tended to obtain higher mean word response scores for paragraphs than did grade 4 Ss (Table 6.6, p. 173). Although the mean number of meaning cues used by grade 8 Ss was not significantly higher than the mean number of meaning cues used by grades 4 and 6, their mean word response scores for paragraphs were significantly higher than those of grades 4 and 6 (Table 6.6, p. 173). These findings seemed to suggest that factors other than the number of meaning cues used by Ss influenced the level of word response scores on the F. W. Tests - Paragraphs.

Relationship: number of meaning cues and word response scores

A significant positive relationship was found between the number of meaning cues used and the word response scores on the F. W. Tests - Paragraphs (Table 6.18) for grade 6 (r = .74) and in grade 8 (r = .67). A positive but not significant relationship between the number of meaning cues and word response scores (r = .46) was revealed for grade 4.

Across the grades, positive but not significant relationships were revealed between the number of meaning cues used and word response scores on the F. W. Tests - Sentences.

Number of meaning cues used by sentence type

Further treatment of the data revealed information concerning

Table 6.18

Coefficients of Correlation: Word Response Scores - F. W. Tests - Sentences and Paragraphs and Number of Meaning Cues Used by Grades 4, 6, and 8

	Sentences			Paragraphs		
Grade	Blank	Nonsense	Combined	Blank	Nonsense	Combined
4	.37	.18	.33	.46*	.39	.46
6	.51*	.32	.44	.64*	.72**	.74**
8	.39	.36	.45	.59**	.51*	.67**

*$p < .05$
**$p < .01$

differences between sentence types (i.e. according to embedded contextual clue) for which there was a significant difference between the mean number of meaning cues used by the Very Proficient and Less Proficient reading groups for sentences and for paragraphs.

Results of the two-way analysis of variance revealed a significant mean difference in the number of meaning cues due to groups for only one sentence type -- Contrast-type contextual clue ($F = 5.00$; $p = .01$). Scheffé tests indicated that the difference between the Very Proficient and Less Proficient reading groups was significant at the .05 level, in favor of the Very Proficient reading group.

Main effects due to grades were revealed for the mean number of meaning cues used in two types of contextual clues -- for Contrast-type ($F = 4.82$; $p = .01$) and for Synonym-type ($F = 6.37$; $p = .00$). In Appendix G reports of the two-way analysis of variance for differences in means for the five types of contextual clues in sentence and paragraph items are presented. Scheffé tests revealed a significant difference between the mean number of meaning cues used for Contrast-type sentences by Ss in grades 4 and 8, in favor of grade 8 ($p < .01$); for Synonym-type the grade 4 Ss used significantly fewer meaning cues than did the grade 6 Ss ($p < .01$) or the grade 8 Ss ($p < .05$). In view of the lower (but not significantly lower) mean word response scores for Contrast-type and Synonym-type sentence items for all grades, and for grade 4 in particular, (Table 6.8, p. 179), it appeared that some Ss experienced considerable difficulty processing these two sentence types, probably because of an inability to abstract meaning at the level required.

In paragraphs main effects due to grade were revealed for only one sentence-type of embedded contextual clue -- Contrast (F = 4.34; p = .02). Scheffé tests revealed that the Very Proficient reading group used a significantly greater number of meaning cues ($p < .05$) than did the Less Proficient reading group. There was no significant difference in the mean number of meaning cues used for the four remaining sentence-types across the grades.

Use of single meaning cue

To determine the extent that a single meaning cue was reported by Ss as having aided them in obtaining the word deleted from the context, a frequency count was made. Table 6.19 shows the percentage of sentence and paragraph items for which Ss elicited word responses and reported use of a single meaning cue to aid them in obtaining word meaning. The percentage of acceptable word responses (Levels 1 or 2 word responses) is also provided.

Of the sentence items, grade 4 Ss reported use of single meaning cues for 15.83 per cent but only 6.94 per cent of the word responses were acceptable (Levels 1 or 2). Grade 6 Ss reported use of single meaning cues for 12.50 per cent of their word responses with only 3.06 per cent success. Grade 8 Ss tended to attempt only 10.56 per cent of the sentence items with word responses based on a single meaning cue but their success was proportionately higher (6.11 per cent) than was reported for grades 4 and 6.

The percentage of acceptable word responses for paragraphs

Table 6.19

Percentage Attempted Word Responses and Percentage Acceptable Word Responses to F. W. Tests - Sentences and Paragraphs, Based on Single Meaning Cues

Grade	Reading Group	Sentences % Attempted	 % Acceptable	Paragraphs % Attempted	 % Acceptable
4	Very Proficient	10.00	6.67	13.33	10.00
	Proficient	18.33	9.17	15.00	3.33
	Less Proficient	19.17	6.00	13.33	5.00
	Total	15.83	6.94	13.89	6.11
6	Very Proficient	8.33	1.67	5.00	3.33
	Proficient	17.50	5.00	10.00	8.33
	Less Proficient	11.67	3.33	11.67	6.67
	Total	12.50	3.06	8.89	6.11
8	Very Proficient	10.00	7.50	10.00	6.67
	Proficient	10.00	5.83	6.67	5.00
	Less Proficient	11.67	6.00	8.33	5.00
	Total	10.56	6.11	8.33	6.11

based on single meaning cues by Ss in grade 4 (4.11 per cent) and in grade 8 (6.11 per cent) was comparable to the percentages of acceptable word responses based on single meaning cues reported for sentences. The percentage of acceptable word responses for grade 6 Ss (6.11 per cent) compared favorably with the percentage acceptable word responses for grades 4 and 8 and was considerably higher than was the percentage of acceptable word responses to sentences (3.06 per cent) when all were based on reported use of single meaning cues.

With respect to other findings of interest relative to use of single meaning cues by Ss, the following summary was made:

1. Reported use of single meaning cues was not confined to test items containing one type of embedded contextual clue over another. Ss' responses revealed that single meaning cues were abstracted from passages containing each of the five types of embedded contextual clue. However, acceptable word responses tended to be obtained more frequently for passages having a specific L/E-type contextual clue than for any of the four remaining types of contextual clues.

2. Reported use of single meaning cues was not limited to word responses obtained during the first reading of the context. A frequency count of the number of times test items were read by Ss reporting use of single meaning cues, indicated that 46 acceptable word responses were made during or following one reading of a sentence, 22 acceptable word responses during or following a second reading, and 5 acceptable word responses after three or more readings of a

sentence item. For paragraph items, 22 acceptable word responses were based on single meaning cues following one reading of the paragraph while 11 acceptable word responses were elicited following two to three readings of the paragraph.

These findings seemed significant, not from the statistical standpoint, but from the point of view that Ss by group and by grade, reporting the use of a single meaning cue, tended to differ considerably in the way the passage was read to obtain an acceptable word response. Reported use of a single meaning cue tended not to be associated with only a partial reading of the context but varied from incomplete reading of the passage to three or more readings. Whether the Ss rereading a passage more than once actually failed to gather additional meaning cues, whether they obtained more than one meaning cue but failed to report them, or whether they considered additional meaning cues unnecessary, was not determined.

Embedded meaning cues versus other meaning cues

The proportions of embedded (E) and other (O) meaning cues reported by group and by grade, as having aided in obtaining the familiar word deleted from the context of sentences and paragraphs, are presented in Table 6.20. Since the E meaning cues were specifically embedded in the context, reported use of a larger proportion of E meaning cues as compared to O meaning cues was to be expected. What seemed important, however, was that Ss did, in fact, report use of meaning cues other than those specifically embedded for that purpose. Of the total number of possible O meaning

Table 6.20

Percentage Embedded and Other Meaning Cues Used by Ss to Obtain Missing Words in F. W. Tests - Sentences and Paragraphs

Grade	Reading Group	Sentences		Paragraphs	
		Embedded[a]	Other[b]	Embedded[c]	Other[d]
		Per cent	Per cent	Per cent	Per cent
4	Very Proficient	62.88	31.37	61.54	33.89
	Proficient	52.78	23.04	53.20	26.67
	Less Proficient	51.26	31.37	48.72	32.22
6	Very Proficient	72.98	39.71	65.38	42.78
	Proficient	59.85	34.31	53.85	31.11
	Less Proficient	56.82	43.14	54.49	36.11
8	Very Proficient	65.40	30.39	69.23	37.78
	Proficient	63.67	33.82	61.54	36.67
	Less Proficient	56.31	30.39	53.25	28.33

[a] N = 66
[b] N = 34
[c] N = 26
[d] N = 30

cues (determined on the basis of Ss' responses which included an explanation of how word meaning was obtained), Ss' responses across the grades tended to include from 23 to 43 per cent for sentences and from approximately 27 to 43 per cent for paragraph items. The proportion of E meaning cues reported as being used to obtain word meaning in sentence items ranged from 51 to 73 per cent of the total possible number of E meaning cues provided by the context. For paragraph items the proportion of E meaning cues used ranged from 49 to 69 per cent. The findings seemed to suggest that the Ss attempting to obtain word meaning from the context of sentences and paragraphs used available meaning cues, embedded specifically or otherwise; therefore, the O meaning cues may have made a considerable contribution to Ss' efforts in processing word meaning from the context.

Summary: use of meaning cues

For the large majority of responses Ss tended to use both E and O meaning cues. For example, Subject #52 stated: "I know that bats can fly through a pitch dark room . . . and then . . . when there is no light . . . so it came right away!" The response seemed to imply that the S thought the missing word might be dark before he reached the Contrast-type meaning cue. He appeared to use the word "light" to check his tentative decision.

By contrast, some Ss' responses revealed that the response was based on either E or O meaning cues. For example, some Ss tended to use only E meaning cues as did Subject #19 who stated, "Well, there's not the faintest glimmer of light." And Subject #37 responded with, "Well, the king ruled the kingdom," using two embedded meaning cues.

On the other hand, for some responses, Ss tended to use only O meaning cues. For example, Subject #51 explained her word response this way: "You usually say pitch darkness. I read 'the bats can fly safely in pitch darkness.' I never even read the rest." Likewise, Subject #40 reported, "I didn't even read the rest of the sentence because a bat can fly about safely in pitch . . . I know a bat can fly around, he has a sort of radar."

Reference to personal experience

A summary of the frequency of Ss' reference to personal experience in responses to the F. W. Tests - Sentences and Paragraphs is presented in Table 6.21.

The Very Proficient reading groups across the grades made reference to personal experience (103 responses) more frequently than did the Proficient reading groups (39 responses) or the Less Proficient reading groups (57 responses).

In grades 4 and 6 the Less Proficient reading groups made reference to personal experience more frequently than did the Proficient reading groups. For the grade 4 Less Proficient reading group, in particular, these findings seemed to suggest that the lag in their mean word response scores may be related to their inability to generalize from personal experiences.

There was a tendency for grade 8 Ss to make more frequent reference to previous personal experience than did the Ss in grades 4 and 6. It is interesting that reference to school experience was

Table 6.21

Frequency of Reference to Personal Experiences in Subjects' Responses to F. W. Tests - Sentences and Paragraphs

		Type of Experience			
Grade	Reading Group	Highly Personal	School	General	Total
4	Very Proficient	8	8	13	29
	Proficient	3	3	1	7
	Less Proficient	13	4	6	23
6	Very Proficient	13	12	19	44
	Proficient	2	2	2	6
	Less Proficient	2	6	6	14
8	Very Proficient	14	6	10	30
	Proficient	14	1	11	26
	Less Proficient	10	1	9	20

made less frequently by the grade 8 Ss having more years of schooling. The gradual increase in frequency of reference to personal experience by grade is also interesting.

Out of the thirteen references made to egocentric (considered highly personal) experience by the Very Proficient reading group in grade 6, eight were made by one S and five by another S. At the grade 8 level, six out of the ten responses, containing similar references to self, were made by one individual: at the grade 4 level, five out of the eighteen Ss referred to "I" experiences. It seemed probable that the tendency to make reference to personal experiences may be peculiar to certain individuals rather than to groups of individuals.

In conclusion, out of the total number of responses to the F. W. Tests - Sentences and Paragraphs, reference to personal experience was made in 9.07 per cent of grade 4 responses, in 11.85 per cent of grade 6 responses, and in 14.05 per cent of the grade 8 responses (Table 6.21).

Processing "time" required to obtain word meaning from context

Since the reported "time" for reading sentences and paragraphs varied considerably, the processing "time" for each was discussed separately, as follows.

Processing "time" sentences

As shown in Table 6.22 the largest proportion of word responses, approximately the same across the grades (37 to 42 per cent), was obtained at the end of first reading of the sentences.

Table 6.22

Processing "Time": Percentage Reported and Percentage Acceptable Word Responses to F. W. Tests - Sentences by Group and by Grade

Gr.	Reading Group	During 1st Reading		End of 1st Reading		During 2nd Reading		End of 2nd Reading		3 or more Readings		No. Responses
		% Reported	% Acceptable	% Reported	% Acceptable	% Reported	% Acceptable	% Reported	% Acceptable	% Reported	% Acceptable	%
4	Very Proficient	10.83	6.67	40.83	26.67	7.50	5.00	24.17	13.33	14.17	7.50	2.50
	Proficient	7.50	4.17	40.83	30.00	7.50	4.17	18.33	5.83	16.67	4.17	9.17
	Less Proficient	6.67	5.00	32.50	13.33	5.00	1.67	17.50	6.67	24.17	14.17	14.17
	Total	8.33	5.28	38.06	23.33	6.67	3.61	20.00	8.61	18.33	8.61	8.61
6	Very Proficient	14.17	5.83	43.33	35.00	11.16	9.17	18.33	12.50	10.83	5.83	1.67
	Proficient	12.50	6.67	45.00	31.67	14.17	6.67	18.33	10.00	7.50	4.17	2.50
	Less Proficient	15.83	3.33	36.67	23.33	12.50	9.17	16.67	8.33	14.17	4.17	4.17
	Total	14.17	5.28	41.67	30.00	12.78	8.33	17.78	10.28	10.83	4.39	2.78
8	Very Proficient	27.50	26.67	47.50	40.00	9.17	7.50	9.17	5.83	5.83	5.00	.83
	Proficient	15.83	12.50	40.83	31.67	17.50	14.17	17.50	10.00	6.67	5.00	1.67
	Less Proficient	23.33	16.67	21.67	18.33	12.50	8.33	18.33	12.50	12.50	7.50	11.67
	Total	22.22	18.61	36.67	30.03	13.06	10.00	15.00	9.44	8.33	5.83	4.72

Of those word responses, the proportion of acceptable (Levels 1 or 2) word responses was 30.03 per cent (36.67 per cent attempted) for grade 8 Ss; 30.00 per cent acceptable word responses (41.67 per cent attempted) for grade 6 Ss; and 23.33 per cent acceptable word responses (38.06 per cent attempted) for grade 4 Ss. While it appeared that the grade 8 Ss tended to be more efficient in obtaining word meaning than were the Ss in grades 4 and 6, these findings were intended to represent the level of efficiency demonstrated by each grade.

The second most frequently reported processing "time" for Ss in grades 4 and 6 was "end of second reading." Although grade 4 Ss reported that the word response first came to mind at the "end of second reading" for 20 per cent of the items, less than half the word responses reported "made sense" in the context (8.61 per cent). The proportion of acceptable word responses for grade 6 Ss was 10.28 per cent when 17.78 per cent of the sentences were read twice before word meaning was obtained.

For grade 8 Ss, the second highest proportion of acceptable word responses was obtained while reading the sentence the first time (less processing "time" compared to more processing "time" reported by grades 4 and 6 for the second highest proportion of reading "times"). The proportion of sentences for which grade 8 Ss reported obtaining word meaning "during first reading" was 22.22 per cent, representing slightly more than one-fifth of the sentence items. The proportion of acceptable word responses obtained "during first reading" was slightly less than one-fifth of the total number of acceptable word responses (18.61 per cent). It appeared that grade 8 Ss were fairly efficient in determining the extent of processing "time" required to obtain word meaning from context. The proportion of acceptable word responses obtained "during first reading" for grade 4 Ss was 5.28 per cent (8.33 per cent attempted); for grade 6 Ss the proportion of acceptable word responses was the same as for grade 4 (5.28 per cent), but a higher proportion of word responses was attempted (14.17 per cent).

Considering the word responses obtained "during first reading" and "end of first reading" combined, grade 8 Ss tended to reduce uncertainty and successfully complete the meaning of the context for approximately 49 per cent of their responses. For the same reported processing "times", grade 6 Ss tended to obtain acceptable word responses for approximately 35 per cent of the sentences. By extending the processing "time", grade 6 Ss obtained additional acceptable word responses for approximately 23 per cent of their responses. Similarly, grade 4 Ss tended to obtain approximately 28 per cent acceptable word responses "during first reading" or at the "end of first reading" and approximately 21 per cent of their acceptable word responses by extended processing "time" (more than one reading of the context).

Although Ss in grades 4, 6, and 8 tended to use all five reported processing "times", there was a tendency for the younger Ss to use more processing "time" than the older Ss used. On the whole, Ss tended to adjust processing "time" to the demands of the context and/or in accordance with their own ability to abstract word meaning from context.

There was a tendency for the Very Proficient grade 8 reading group to report less processing "time" (i.e. "during first reading" or "end of first reading") for acceptable word responses (approximately 66 per cent) than did the Proficient (approximately 44 per cent) or the Less Proficient (approximately 35 per cent) reading groups. In grades 4 and 6, however, the differences between the Very Proficient and Proficient reading groups were less pronounced. In grade 4, both groups obtained acceptable word responses for approximately 33 per cent of the sentences for which meaning was completed "during first reading" or at the "end of first reading." In grade 6 the Very Proficient reading group obtained word meaning for approximately 40 per cent of the sentences read for which the word was called to mind "during first reading" or at the "end of first reading;" for the Proficient reading group the proportion was slightly lower, approximately 38 per cent. During the interviews, it was observed that the younger Very Proficient and Proficient reading groups tended to read sentences very carefully. At times, they tended to use more processing "time" to complete the meaning of some items than did the Less Proficient reading groups.

It is possible that Ss might have processed the context differently if an actual time limit had been placed on each item. It is also possible that the same number of acceptable word responses might have been obtained with processing time limited. On the other hand, some Ss read the passages very rapidly yet reported three or more readings in order to obtain word meaning. The actual time required for a S to complete one set of sentence items (i.e. for reading and responding) varied from less than twenty minutes to more than thirty minutes.

Processing "time": paragraphs

Grade 8 Ss obtained acceptable word responses for 30.00 per cent of the paragraph items (35 per cent attempted) for which meaning was completed "during first reading" (Table 6.23). This proportion was higher than for any of the four remaining reported "times".

Grade 6 Ss tended to obtain acceptable word responses "during first reading" of paragraphs for 21.11 per cent of the items, a slightly lower proportion than was reported for "end of first reading" (26.11 per cent) but higher than was reported for any of the remaining processing "times".

For grade 4 Ss, the highest proportion of acceptable word responses (27.78 per cent) was obtained at the "end of first reading;" the second highest proportion (12.78 per cent) was obtained following three or more readings. Although grade 4 Ss attempted to complete the meaning of 20.00 per cent of paragraph items "during first reading," the proportion of acceptable word responses was only 11.67 per cent.

In grades 4 and 6, the Very Proficient reading groups tended to obtain a higher proportion of acceptable word responses in less processing "time" than did the Less Proficient reading groups. In grade 8, however, the differences were not pronounced for "during first reading" reported word responses. (Less Proficient reading group 33.33 per cent acceptable word responses as compared to 28.33 per cent for each of the other groups). For all groups across the

Table 6.23

Processing "Time": Percentage Reported and Percentage Acceptable Word Responses to F. W. Tests - Paragraphs by Group and by Grade

		During 1st Reading		End of 1st Reading		During 2nd Reading		End of 2nd Reading		3 or more Readings		No. Responses
Gr.	Reading Group	% Reported	% Accept- able	% Reported	% Accept- able	% Reported	% Accept- able	% Reported	% Accept- able	% Reported	% Accept- able	%
4	Very Proficient	20.00	16.67	43.00	35.00	11.67	6.67	18.33	18.33	5.00	5.00	1.67
	Proficient	15.00	5.00	38.33	25.00	21.67	13.33	8.33	5.00	13.33	5.00	3.33
	Less Proficient	25.00	13.33	26.67	23.33	8.33	6.67	8.33	1.67	20.00	8.33	11.67
	Total	20.00	11.67	36.11	27.78	13.89	8.89	11.67	8.33	12.78	6.11	5.56
6	Very Proficient	38.33	26.67	38.33	33.33	11.67	10.00	10.00	8.33	1.67	0.00	0.00
	Proficient	25.00	16.67	30.00	20.00	35.00	21.67	8.33	5.00	0.00	0.00	1.67
	Less Proficient	33.33	20.00	31.67	25.00	11.67	6.67	11.67	8.33	8.33	5.00	3.33
	Total	32.22	21.11	33.33	26.11	19.44	12.78	10.00	7.22	3.33	1.67	1.67
8	Very Proficient	31.67	28.33	36.67	31.67	30.00	30.00	0.00	0.00	1.67	0.00	0.00
	Proficient	30.00	28.33	26.67	23.33	30.00	23.33	6.67	6.67	6.67	1.67	0.00
	Less Proficient	43.33	33.33	23.33	16.67	16.67	13.33	3.33	3.33	1.67	1.67	11.67
	Total	35.00	30.00	28.89	23.89	25.56	22.22	3.33	3.33	3.33	1.11	3.89

grades, when more than one reading of the context was required, the proportion of acceptable word responses tended to vary; for example, when meaning was reported at the "end of second reading," Very Proficient and Less Proficient reading groups in grade 6 obtained acceptable word responses for 8.33 per cent, having reported that approximately 11 per cent of the items were attempted. The findings suggested that considerable processing "time" seemed to be required for certain paragraph items, whether the S was in the Very Proficient or Less Proficient reading group. Moreover, since all words deleted from the context were familiar, the processing problem seemed to be that of abstracting the meaning from the context.

In addition to calculating the percentages of processing "time" reported by Ss, the following observations were made during the personal interviews and from analyzing the protocols:

1. No subject reported reading all passages the same way; that is, the extent of reading required to obtain the missing word varied by S as well as by group.

2. Some Ss revealed a tendency toward a "reading style"; for example, they might read the sentence to obtain an overview, making no attempt to complete the context until a second reading. By contrast, other Ss tended to read a segment (usually one meaning cue), or as far as the missing word, pause and think about it, and then proceed to the end of the next segment or to the end of the sentence.

3. Grade 4 Ss and the Less Proficient groups in grades 6 and 8, if required to read a sentence more than once, seemed to

reread the entire sentence rather than to reread important meaning cues, as was reported by the more proficient readers.

4. Most Ss, in retrospect, gave a general rather than a specific account of how the context was read. A limited number of Ss, however, without prompting, demonstrated how they read the sentence by reading it orally, pausing where they "stopped to think about it" before proceeding. For example, Subject #42 reported reading sentence #10B as follows: "'If you wish to (pause) in whatever task you set out to do (pause), you should ....hard.' I read the whole sentence like that and I looked at 'hard' and the 'wished to' and so I thought 'succeed'." Similarly, Subject #22 said, "Well, like I was reading it and I sorta stuck it. . . put it in. . . and glanced over. I read 'The (blank) air' and I stopped and thought 'the light air which was fresh and crisp. . .office' and then, you see, I left it 'cause it sounded O.K."

5. Ss within each group tended to vary in how any one paragraph was reportedly read. For example, in response to paragraph 1B, from the Very Proficient reading grade 8 reading group, the following responses were obtained:

Subject #37 - I just read to "meteors".

Subject #39 - I had to read the whole paragraph and then I read the first sentence and thought of the word.

Subject #40 - I read to "stars" only and I got light after "flashing."

In grade 4, responses similar to the following were given:

Subject #16 - I read all the parts up there to "sky". I thought of the word and I read the rest.

By comparison, Subject #4 (Very Proficient reading group) reported: "After I read the paragraph once, I thought light would fit and then I read it over again with the word light in it, and then I checked it."

Processing "time" in relation to placement of word deleted from context

As reported in Chapter IV, the word missing from the context was placed near the beginning, near the middle, and near the end of the sentence items to make comparisons possible between Ss' word responses in relation to word placement.

In Table 6.24 the percentage of acceptable word responses, according to word placement in the context, is provided by group and by grade. The Very Proficient and Proficient reading groups, across the grades, appeared to obtain word responses with considerably greater accuracy when the missing word was placed near the end of the sentence. By contrast, the Less Proficient reading groups, particularly in grades 4 and 6, tended to experience only slightly more success in obtaining an acceptable word required near the end of the context as compared to words missing near the beginning or middle of the context.

These findings seemed to suggest that the proficient reader was able to select essential information, hold it in mind, and relate it to other information gathered while reading. Consequently, by the time the end of the passage was reached, conclusions were drawn rapidly and efficiently. In addition, it is possible that cumulative information may be more readily processed to create new information

Table 6.24

Percentage Acceptable Word Responses Relative to Placement of Missing Word in
F. W. Tests - Sentences

	Grade 4			Grade 6			Grade 8		
Reading Group	Beginning	Middle	End	Beginning	Middle	End	Beginning	Middle	End
Very Proficient	43.75	60.42	87.50	70.83	58.33	83.33	85.42	79.17	95.83
Proficient	45.83	37.50	75.00	60.42	50.00	75.00	62.50	75.00	91.67
Less Proficient	43.75	35.42	45.83	41.67	50.00	58.33	56.25	64.58	75.00
Total	44.44	44.45	69.44	57.84	52.78	72.22	68.06	72.92	87.50

(the missing word) when presented sequentially, making regressive processing a choice rather than a need as, for example, when the word is deleted near the beginning or near the middle.

To determine whether there was a possibility of a relationship between processing "time" and placement of the missing word near the beginning, middle, or end of the context of sentences, percentages of acceptable word responses were calculated by grade. The results (Table 6.25) suggested that sentences structured so that subjects were able to obtain word meaning at the end of one reading, irrespective of missing word placement, resulted in highest efficiency. Grade 4 Ss seemed to benefit further, if the missing word was placed near the end, for sentences requiring only one reading. For sentences requiring more than one reading, Ss across the grades seemed to obtain acceptable word responses more efficiently if the missing word was located near the end of the sentence.

Reported rereading to "make sure"

The proportion of sentences reread by groups in grade 4 tended to vary slightly; by grade the proportion was 30.83 per cent (Table 6.26). Whether proficient or potentially proficient, the grade 4 Ss seemed to check word meanings more frequently than did the older Ss in grades 6 and 8 (15.28 per cent). It is possible that the grade 4 Ss tended not to be sufficiently experienced with written language to trust their own judgment without considerable checking. It is also possible that others, like Subject #13, checked

Table 6.25

Processing "Time" and Placement[a] of Acceptable Word Responses in
F. W. Tests - Sentences

	Grade 4			Grade 6			Grade 8		
Stage of Reading	Beginning	Middle	End	Beginning	Middle	End	Beginning	Middle	End
During First Reading	6.25	4.17	5.56	5.56	6.94	15.28	17.36	17.36	23.61
End First Reading	20.83	21.53	31.94	27.01	27.01	30.56	29.86	30.56	29.17
During Second Reading	1.39	3.47	8.33	6.25	7.64	12.50	8.33	9.03	15.28
End Second Reading	11.81	4.86	9.72	14.58	5.56	9.72	6.25	10.42	13.89
After 3 or more Readings	4.17	10.42	13.89	4.17	5.56	4.17	6.25	5.56	6.94

[a] Beginning: N = 8
Middle: N = 8
End: N = 4

Table 6.26

Percentages: Rereading Sentences and Paragraphs (F. W. Tests) to "Make Sure"

Reading Group	Grade 4 Sentences	Grade 4 Paragraphs	Grade 6 Sentences	Grade 6 Paragraphs	Grade 8 Sentences	Grade 8 Paragraphs
Very Proficient	32.50	56.67	12.50	15.00	13.33	20.00
Proficient	28.33	20.00	10.83	10.00	20.83	33.33
Less Proficient	31.67	41.67	22.50	18.33	11.67	10.00
Total	30.83	39.45	15.28	14.44	15.28	21.11

the sentences "because my teacher, Mrs. . . . always tells us to reread it to make sure."

In grades 6 and 8 rereading by groups tended to vary. In grade 6 the Less Proficient reading group reread 22.50 per cent of the paragraphs to check the word meaning; in grade 8 the Proficient reading group reported rereading 20.83 per cent of the paragraphs compared to only 13.33 per cent reread by the Very Proficient reading group and 11.67 per cent reread by the Less Proficient reading group.

Reported rereading of paragraphs to check meaning was reported most frequently by grade 4 (for 39.45 per cent of the items), followed by grade 8 (for 21.11 per cent of the items). Grade 6 Ss reported rereading only 14.44 per cent of the paragraphs which was consistent with their reported rereading of sentence items (15.28 per cent).

While there was a tendency for Ss to report a lower proportion of paragraphs read more than once than was reported for sentences, there was also a tendency to reread paragraph items to check word meaning more frequently than was reported for sentence items.

Description: how reading was done

There was a tendency for grade 4 Ss to reread to check meaning in a manner somewhat different from that of the Ss in grades 6 and 8. Grade 4 Ss tended to reread the entire sentence in contrast to the older Ss who tended to reread by skimming to "make sure." For paragraphs, grade 4 Ss seemed to reread the whole paragraph. Ss in grades 6 and 8 rarely reread the entire paragraph to check meaning; instead, they reported rereading the sentence containing the blank or nonsense word or they checked key words or expressions in the paragraph. For example, in checking paragraph 3B to "make sure", the differences between younger and older subjects is reflected in the following examples.

Subject #3 - . . . then I thought I should have "beautiful" and I read it over a second time to make sure that it would go good.

Subject #19 - I read the paragraph once and the sentence, "thousands of dollars worth. . ." twice.

Subject #41 - And I read the whole thing once and the second time "thousands of . . . possession," I read that about three times so that I could make sure it sounded O.K.

Subject #40 - I read to the end and skimmed parts . . . I put the word in and checked parts a second time.

On the whole, although Ss across the grades tended to reread some sentences and paragraphs to check meaning, the concern was greatest in grade 4 (31 to 40 per cent of sentences and paragraph reread for that purpose).

Use of the Intellect

Use of reasoning ability by group and by grade

Results of the two-way analysis of variance on reasoning scores for sentences (Table 6.27) revealed significant main effects due to group (F = 14.75; p = .00). Scheffé tests revealed that the

Table 6.27

Mean Reasoning Scores on F. W. Tests - Sentences by Group and by Grade

Grade	Reading Group	Mean	Variance
4	Very Proficient	14.00	44.80
	Proficient	4.83	19.77
	Less Proficient	1.67	3.47
6	Very Proficient	15.67	57.17
	Proficient	12.67	48.67
	Less Proficient	9.00	61.60
8	Very Proficient	25.17	37.37
	Proficient	17.83	17.77
	Less Proficient	12.50	20.30

Significant Sources of Variance	Prob.
Group	.00***
Grade	.00***

There was no significant interaction between group and grade ($p = .63$)

Scheffé Tests of Significance Between Groups

	Very Proficient	Proficient	Less Proficient
Very Proficient		.01**	.00***
Proficient			.13
Less Proficient			

Scheffé Tests of Significance Between Grades

	4	6	8
4		.02*	.00***
6			.02*
8			

*$p < .05$

**$p < .01$

***$p < .001$

mean reasoning scores of the Very Proficient reading groups were significantly higher than were the mean reasoning scores of the Proficient ($p < .01$) and the Less Proficient reading groups ($p < .001$). There was a difference (not significant) in mean reasoning scores in favor of the Proficient reading groups over the Less Proficient reading groups. The variance in both groups was considerable, suggesting that the reasoning ability of certain individuals in grades 4, 6, and 8 tended not to be stabilized.

Main effects due to grades were also revealed in the treatment of the reasoning scores ($F = 17.72$; $p = .00$). Scheffé tests revealed differences between the mean reasoning scores of grades 4 and 6 and between the mean reasoning scores of grades 6 and 8 at the .05 level of significance, in favor of the higher grade, for each test. Differences in mean reasoning scores were significant at the .001 level between the mean reasoning scores of grades 4 and 8, in favor of grade 8.

Results from the two-way analysis of variance on reasoning scores for paragraphs disclosed differences in mean reasoning scores due to group ($F = 14.09$; $p = .00$). Scheffé tests revealed a difference in mean reasoning scores between the Very Proficient and the Less Proficient reading groups ($p < .001$) and between the Very Proficient and the Proficient reading groups ($p < .01$), in favor of the Very Proficient reading group (Table 6.28). The mean reasoning scores of the Proficient reading groups were higher (but not significantly higher) than were the mean reasoning scores of the Less Proficient reading groups. From the standpoint of similar reading potential

Table 6.28

Mean Reasoning Scores on F. W. Tests - Paragraphs by Group and by Grade

Grade	Reading Group	Mean	Variance
4	Very Proficient	10.67	12.57
	Proficient	4.83	17.37
	Less Proficient	3.17	8.17
6	Very Proficient	13.17	10.97
	Proficient	8.00	14.00
	Less Proficient	7.33	15.47
8	Very Proficient	14.17	3.77
	Proficient	11.17	11.47
	Less Proficient	8.50	21.00

Significant Sources of Variance	Prob.
Group	.00***
Grade	.00***

There was no significant interaction between group and grade (p = .83)

Scheffé Tests of Significance Between Groups

	Very Proficient	Proficient	Less Proficient
Very Proficient		.01**	.00***
Proficient			.31
Less Proficient			

Scheffé Tests of Significance Between Grades

	4	6	8
4		.02*	.00***
6			.28
8			

$*p < .05$
$**p < .01$
$***p < .001$

between the two groups as demonstrated by criterion vocabulary scores (Chapter III, Table 3.2) which were not significantly different, the discrepancy in mean reasoning scores seemed relevant in determining possible reasons for the differences between the reading power of the two groups.

On the whole, the patterns of mean reasoning scores by group and by grade for sentences and for paragraphs tended to be similar to the patterns of word response scores on the F. W. Tests - Sentences and Paragraphs. That is, the word response scores seemed to reflect the level of understanding of the context achieved through use of reasoning to determine the unknown word, a familiar word deleted from the context.

Relationship between reasoning ability, ability to obtain word meaning from context, and IQ

A significant positive relationship was revealed between the reasoning scores and the word response scores on the F. W. Tests - Sentences and Paragraphs (Table 6.29). Coefficients of correlation between reasoning scores and word response scores for sentences by grade were: grade 4 ($r = .93$), grade 6 ($r = .92$), and grade 8 ($r = .86$), each at the .001 level of significance. For paragraphs, the coefficient of correlation between reasoning scores and word response scores by grade were also significant at the .001 level; grade 4 ($r = .71$), grade 6 ($r = .92$), and grade 8 ($r = .87$).

There was a significant positive coefficient of correlation between IQ scores and reasoning scores for sentences, with the highest relationship at the grade 8 level ($r = .65$; $p = .01$) and

Table 6.29

Coefficients of Correlation: Reasoning Scores and IQ; Reasoning Scores and Word Response Scores - F. W. Tests - Sentences and Paragraphs

	Reasoning Scores and IQ		Reasoning Scores and F. W. Tests Scores	
Grade	Sentences	Paragraphs	Sentences	Paragraphs
4	.499*	.324	.933***	.705***
6	.590**	.773***	.922***	.919***
8	646**	.473	.855***	.870***

*$p < .05$
**$p < .01$
***$p < .001$

lowest at the grade 4 level ($r = .50$; $p < .05$). For paragraphs, only at grade 6 level was there a significant coefficient of correlation ($r = .77$; $p < .001$) between reasoning scores and IQ scores. For grade 4 Ss the positive but not significant coefficient of correlation ($r = .32$) was anticipated since the mean reasoning scores of grade 4 Ss were significantly lower than were the mean reasoning scores of Ss in grade 6 and 8. Nevertheless, grade 4 IQ scores were not significantly lower than were those of Ss in grades 6 and 8 (Chapter III, p. 73). On the other hand, in grade 6 the mean IQ scores were significantly lower than were those of grades 4 and 8, but their mean reasoning scores were significantly higher than were those of grade 4. These findings seemed to suggest that the reasoning ability of grade 4 Ss tended not to be as well developed as the reasoning abilities of Ss in grades 6 and 8 but the potential, indicated by their IQ scores, appeared to be developing.

Reasoning ability in sentences versus paragraphs

Results from correlated t tests (Table 6.30), for which the mean reasoning scores for sentences and paragraphs by grade were converted to percentages, revealed that Ss across the grades made significantly fewer errors in reasoning when the context was a paragraph rather than a sentence. In grade 4 ($t = -3.75$) the difference was significant at the .01 level; in grade 6 ($t = -4.28$) and in grade 8 ($t = -4.24$) the differences were significant at the .001 level, both in favor of the paragraphs.

Why the Ss were able to reason more proficiently in paragraphs

Table 6.30

Correlated t Tests: Reasoning Scores Sentences and Paragraphs (F. W. Tests) by Grade

	Sentences		Paragraphs			
Grade	$\overline{X}$	S.D.	$\overline{X}$	S.D.	t	Prob.
4	17.08	17.00	30.28	22.08	-3.75	.01**
6	31.11	18.38	47.50	21.30	-4.28	.001***
8	46.25	17.31	57.22	19.67	-4.24	.001***

**p < .01
***p < .001

than in sentences was not revealed. It is possible that the sentence structure was more complex in single sentences than in the sentences used in paragraphs, resulting in more problems for the Ss. It is also possible that, although the vocabulary levels of sentences and paragraphs were controlled on the basis of reading ease (Thorndike & Lorge word count), levels of conceptualization required to comprehend the full import of ideas included in certain test items may have affected reasoning abilities.

It is interesting to consider that the average number of meaning cues used by Ss in sentences compared to the number of meaning cues used in paragraphs tended not to differ significantly. Nevertheless, Ss' ability to use the meaning cues in order to obtain word meaning from context was reflected in the significant differences between mean reasoning scores for sentences and paragraphs, and tended to favour the paragraphs. It seemed, therefore, that factors other than the extended context of the paragraph contributed to Ss' success in reasoning more proficiently in paragraph items than in sentence items in order to complete the meaning of the context.

Faulty reasoning: cause or effect of reduced reading proficiency

In this study, faulty reasoning was characterized by categories of specific errors in interpreting the context of sentences and paragraphs. It was not possible, however, to determine whether these errors were caused by the Ss' inability to reason or whether the Ss' failure to perceive the context as written resulted in faulty reasoning. Good reasoning was not the sole prerogative of the Very Proficient reading groups, nor of one grade, even though the grade 8 mean reasoning scores were significantly higher. Furthermore, faulty reasoning was not exclusive to a particular group or grade.

Whether due to cause or effect, some Ss seemed able to assimilate the meaning cues located in some passages, but they were not always equally successful in accommodating them to a new environment; that is, by way of a familiar word required to complete the context. For example, in obtaining word meaning for sentence 3N, a number of Ss across the grades seemed to operate at the concrete level. The meaning cue "scattered", along with other meaning cues, was abstracted from the context but tended to be interpreted frequently as"scattered it" (action of the subject, "Arthur") rather than by way of the more abstract concept of the puzzle lying "scattered around the room". At the same time, other Ss tended to conceive Arthur wrecking the puzzle ("that's what I do"). Unable to generalize, some Ss' responses were tied to concrete behavior (Thomson, 1959, p. 99). On the other hand, the question might be raised as to whether the Ss could have completed the context with the intended meaning "left" if the sentence were structured differently; for example, with the word "finished" omitted instead of "left", or if the less familiar structure "partially done and scattered" were expanded to "it was partially done and scattered", or even deleted from the context. It might then be possible to determine whether the structure of the sentence (apart from the fact that the sentence included a Contrast-type of embedded contextual clue) contributed to the comprehension problem or whether the S was not cognitively ready to solve the problem no matter how the sentence was structured.

Although each S's responses revealed a tendency to reason logically for some of the operations, it seemed equally apparent that he was unable to handle all abstract operations equally well; that is, even the Very Proficient reading groups, across the grades, tended to revert to concrete behavior in obtaining word meaning from some contexts. By changing the context, by omitting or ignoring words or phrases, or by making additions to the context when considered essential in order to complete its meaning, subjects striving to reason how to relate the parts (meaning cues) abstracted from the context, tended to "make sense" out of the context to the best of their ability, even though the intended meaning was not called to mind.

Summary

Information obtained from the analyses of Ss' responses, which included word responses and the Ss' explanations of how they completed the task of obtaining the unknown word deleted from the context of test items in the F. W. Tests - Sentences and Paragraphs, was reported in this chapter.

Ss' word responses revealed that Ss' across the grades used linguistic information provided by the context with varying amounts of success. With respect to use made of syntactic information, the percentage accuracy of word responses in relation to the correctness of word form class (i.e. correct use of a noun, verb, adjective, or adverb) ranged from 93 per cent to 98 per cent for both sentences and paragraphs. No significant differences were found in the mean word response scores by word form class. It appeared that Ss' difficulties in obtaining word meaning from context were not significantly related to word form class of the unknown word deleted from the context.

It was also revealed that errors in inflectional endings, few in number, were made only in responses to test items in which the deleted word was replaced by a nonsense word having the correct inflectional ending provided.

Considerable variance was found in Ss' reported use of the six selected function words located in five sentence items. The proportion of acceptable word responses to sentences containing these function words ranged from 30 per cent in grade 4 to 61 per cent in grade 8 and, although there was some evidence that Ss tended to use the function words as meaning cues, no significant conclusions were drawn.

Significant information was obtained concerning Ss' use of the semantic information furnished by the context to trigger use of their own linguistic knowledge while processing word meaning from context. By first examining the product of the reading process--Ss' word responses--significant differences were revealed by group and by grade in the quality of the words elicited to complete the meaning of the context. For both sentences and paragraphs, the Very Proficient reading groups enjoyed significantly greater control of language, as evidenced by the quantity and quality of word responses, than did the Proficient and Less Proficient reading groups. Although the Less Proficient reading groups were not significantly less able to obtain acceptable word responses than were the Proficient reading groups, there was an obvious discrepancy in their ability to control the language as indicated by lower mean word response scores.

The ability of Grade 8 Ss to control the language of the word elicited to complete the meaning of the context was significantly superior to the ability of Ss in grades 4 and 6 to derive words similar in quality. Likewise, it was revealed that grade 6 Ss' word responses were significantly superior, both in the quality and in the quantity of acceptable words used to complete the context, than were the word responses of grade 4 Ss.

Meaning cues used by the fifty-four Ss tended not to be used the same way nor in equal numbers by all Ss. Although the Very Proficient reading groups used significantly more meaning cues than did the other two groups, it was only in grade 6 that Ss used significantly more meaning cues than were used by Ss in grades 4 and 8.

In explaining their use of meaning cues to obtain word meaning from sentences and paragraphs, Ss reported five different processing "times" required to accomplish the task. Of those reported reading or processing "times" required to first call to mind the word deleted from the context, the most frequent "time" was "end of first reading" for sentences and for paragraphs across the grades. There was a tendency, however, for Ss to report use of less processing "time" to obtain word meaning from paragraphs than from sentences; grade 8 Ss tended to obtain more acceptable word responses with less processing "time" reported than did Ss in grades 4 and 6; grade 4 Ss tended to require more processing "time" to obtain acceptable word responses than did Ss in grades 6 and 8. They also tended to report rereading to "make sure" more frequently than did Ss in grades 6 and 8.

Reference to personal experience was made by Ss in from 9 to 14 per cent of their responses. There was a tendency for grade 8 Ss to make more frequent reference to personal experiences while explaining how word meaning was obtained from context than was made by Ss in grades 4 and 6.

Findings related to Ss' use of reasoning to analyze the context, relate the meaning cues abstracted from the context to the meaning of the passage, and make judgments concerning the word of "best fit" to complete the meaning of the context were significantly different by group and by grade. For both sentences and paragraphs, the Very Proficient reading groups were able to reason more efficiently than were the Proficient or Less Proficient reading groups; the Proficient reading groups made significantly greater use of reasoning than did the Less Proficient reading groups. By grades, the grade 8 Ss' mean reasoning scores for sentences and for paragraphs were significantly higher than they were for grade 4. Grade 6 Ss were more efficient in reasoning than were grade 4 Ss for both sentences and paragraphs. Grade 6 Ss, however, were significantly less efficient than were the grade 8 Ss in their ability to use reasoning to determine the unknown word deleted from the context of sentences; for paragraph items there was no significant difference in reasoning ability of grade 8 Ss over grade 6 Ss.

CHAPTER VII

ANALYSIS AND FINDINGS: U. F. W. TESTS - SENTENCES AND PARAGRAPHS

This chapter provides a brief outline of the procedures used to analyze the data obtained from Ss' responses to the U. F. W. Tests - Sentences and Paragraphs. Results from the statistical treatment of the data are reported and supplemented by descriptive information obtained from the data and from observations made during the interviews.

Analysis: Ss' Responses to U. F. W. Tests - Sentences and Paragraphs

Ss' responses to the U. F. W. Tests - Sentences and Paragraphs were analyzed by following the same general plan as was outlined for the F. W. Tests - Sentences and Paragraphs (Chapter V). Adjustments were made when required; for example, in relation to use of syntactic information, the analysis was confined to word form class. The same criteria were used for classification of meaning cues and reasoning scores. For classification of word meaning responses, however, criteria, appropriate to the given tasks, were devised. Numerical values, ranging from 4 to 1 for Levels 1 to 4 respectively, were applied to each word meaning response in order that a qualifying judgment of quantitative measurement of word meaning scores could be obtained and the data submitted to statistical treatment.

Criteria for classification of word meaning responses

The following criteria were developed for use in determining the quality of each elicited meaning response on the basis of the level of the response. In addition to the examples of Ss' responses, representing typical elicited meaning responses placed in each of the four levels, four examples of Ss' responses to the same item are placed together at the end of the description of the classification scheme to make possible an overview of how the plan operated.

Level 1 - The meaning of the underlined, unfamiliar word was stated clearly and precisely. The elicited response was considered appropriate because it satisfied at least one of the following criteria:

1. The meaning elicited from the S coincided with the definition in Webster's (Intermediate) Canadian Dictionary or as stated in the context of the given sentence or paragraph.

2. The word meaning response was supported by evidence obtained from the context by way of one or more of the given contextual clues and stated in such a manner that the relationship between the underlined unfamiliar word and the stated clues was made clear, either directly or by inference.

For example, in response to the sentence in which the word bewail was surrounded by a synonym clue, these responses were given: Subject #37 - mourned - Well, because of his death, you know. Well, as I say, they've got "mourned" there. I sort of saw it but it was "death" that made me think of it. (Very Proficient reading group, grade 8)

Subject #12 - Well, they cried . . . well, 'cause their cat died. If your cat dies, you cry. (Proficient reading group, grade 4)

Level 2

1. The meaning of the underlined unfamiliar word was stated:

(a) in terms less explicit than the definition given in Webster's (Intermediate) Canadian Dictionary but indicating that sufficient meaning was obtained to make understanding of the context possible.

(b) in terms which contained part of the definition, ensuring some meaning but lacking the clear understanding of meaning inferred by a Level 1 response.

2. The meaning attached to the word was related by the S to one or more of the given contextual clues, but may have failed to include the main (key) clue(s), basic to full understanding of the underlined unfamiliar word.

The following examples of responses to sentences containing the word bewail, each with a specified type of embedded contextual clue, were considered Level 2 meaning responses:

Subject #3 - I think it might mean they thought of their cat or else they were sad to lose it. If you lose your cat, you're pretty sad. (Synonym sentence type)

Subject #11 - That's being sad. Well, it said "with salty tears and silent sadness." Well, you'd be sad 'cause you lost your cat. You'd cry and be sad "for a long, long time." (D/D sentence type)

Level 3

The subject gave evidence that he was attempting to use the context to get word meaning but the response was not considered Level 1 or 2 in quality because the definition or explanation elicited exhibited one or more of the following characteristics:

1. The meaning given was general rather than specific to the context; for example, for bewailed, "felt bad" or "remembered" was elicited.

2. The definition tended to be at the concrete level with the response embedded in action; for example, for flaunted, Subject #16 said, "strutted because he Mr. Peacock liked to show off his feathers". That is, the emphasis was placed upon the strutting itself rather than upon the more abstract concept of inner pride made evident by "showing off".

3. The response offered but a vague or hazy notion of the meaning of the underlined unfamiliar word.

The following examples of Ss' responses demonstrated that one or more of the above characteristics might be evident in a single response. The unfamiliar word bewail again serves as an example.

Subject #13 - They remembered his death for a long, long time.

Subject #6 - They remembered. Their pet cat, Ginger, died and so they wanted to remember it . . . .

Level 4

Responses placed in the lowest category, Level 4, revealed that the S seemed able to obtain little or none of the intended meaning for the unfamiliar word in context. Responses were placed in Level 4 for one or more of the following reasons:

1. The context was changed by the reader to make the meaning "fit"; for example, for *bewail*, *Subject #7* stated, "to think. She wanted to think that he was 'on some great adventure', she didn't want to think he was dead."

2. The response was incorrect in that the relationships between the parts and the whole passage were not clearly determined in relation to the given information; for example, "*bewailed*, well it got less. Like something. . .uh. . .like something bad happens, usually each day it sorta gets less."

3. The response was either bizarre or no attempt was made to define the unfamiliar word. If an explanation was given, it tended to have little or no bearing on the meaning of the unfamiliar word; for example, *Subject #50* defined *bewailed* as "noticed" supporting the response by, "their pet had been gone for over a month so they wouldn't think of it much after. . . ."

To demonstrate further the differences in quality of meaning conveyed by Ss' explanations of the meaning of an unfamiliar word, the following examples of grade 4 responses to the same item -- the paragraph containing the underlined word *ambergris* -- are provided:

Example: Level 1 response

Subject #1 - Well, ambergris is a substance. It is a waxy substance. I think it helps keep the scent of perfume um. . .to last longer and it comes from the sperm whale. (main meaning cues incorporated in the explanation)

Example: Level 2 response

Subject #2 - Ambergris is a certain type of whale oil. Well, at the bottom it says, "if it were not for this waxy substance obtained from the sperm whale." It's used in perfume. (designation of the "waxy substance" as "oil" not based on context; probably related to prior knowledge of whales)

Example: Level 3 response

Subject #11 - That's sorta perfume. It was talking about perfume in the paragraph. (unacceptable meaning but not unrelated to context)

Example: Level 4 response

Subject #5 - A flower because it. . .the "delicate scent of orange blossoms". . .an artificial flower. . ." a waxy substance obtained from the body of the sperm whale". (tendency to confuse "flower" and "waxy substance"; that is, an "artificial flower")

Findings relative to how Ss approached the task of obtaining the meaning of unfamiliar words in the U. F. W. Tests - Sentences and Paragraphs were based on the use made of: (1) linguistic information and (2) the intellect.

Findings: Use of Linguistic Information

Results of percentage calculations and statistical treatment of the data revealed that Ss were able to use both syntactic and semantic information provided by the context to obtain the meaning of unfamiliar words with varying amounts of success as discussed in the following sections.

Use of Syntactic Information

Word form class

In responding to the U. F. W. Tests - Sentences and Paragraphs Ss made no direct reference to the syntax of a particular word form class. Responses suggested, however, that Ss tended to use intuitive knowledge of the grammar in their attempts to obtain the meaning of an unfamiliar word from context. Whether the unfamiliar word was a noun, verb, or adjective, Ss' responses revealed a tendency to obtain syntactic meaning even though the semantic information of the context was not understood. For the three word form classes (nouns, verbs, and adjectives) the percentage accuracy for grade 4 word meaning responses ranged from 83 to 88 per cent; for grade 6 the percentage accuracy of word form ranged from 85 to 88 per cent; for grade 8 the range was somewhat higher -- from 91 to 94 per cent accuracy of word form, regardless of the word meaning elicited. (Table 7.1) At this stage of the analysis, no consideration was given to the semantic content of Ss' responses -- only word form class.

For example, in attempting to give meaning to the word flaunt, expressions such as, "flaunt - to show off" or "it says 'she flaunted every. . .'so that means she showed off" were considered syntactically acceptable. For nouns, such as ambergris, responses like "is a substance" or "is a perfume" seemed to indicate an awareness of the basic grammatical requisites for the unfamiliar word being defined. For the adjective, piscatorial, meanings such as "good,"

Table 7.1

Percentage Accuracy Word Form Class in Word Meaning Responses - Sentences and Paragraphs

Grade	Nouns	Verbs	Adjectives
4	87.50	83.33	83.33
6	87.50	84.72	86.11
8	91.67	94.44	90.90

"certain," and "great" seemed to suggest that, in spite of apparent inability to obtain an appropriate level of meaning, the correct word form class was elicited.

As shown in Table 7.2, the percentages acceptable word meaning responses by word form class tended to be lower than were the percentages accurate word form class of Ss' word meaning responses (Table 7.1). In grade 4, for example, 87.50 per cent of the unfamiliar words used as nouns were grammatically accurate; the percentage acceptable word meaning responses for sentences was slightly lower (84.03 per cent) but for paragraphs the proportion of acceptable word meaning response was considerably lower, (69.44 per cent) suggesting the ability to obtain syntactic meaning was somewhat higher than was the ability to gather semantic meaning.

By grade, the proportion of acceptable word meaning responses for unfamiliar words used as nouns or verbs varied slightly. In grade 4, the proportions of acceptable responses for nouns (approximately 76 per cent) was slightly higher than was the proportion of acceptable word meanings for verbs (approximately 74 per cent); in grade 6 the proportion of acceptable word responses was for nouns and verbs approximately the same (about 77 per cent). In grade 8, the proportion of acceptable word responses for unfamiliar words used as verbs (approximately 84 per cent) was somewhat higher than for unfamiliar words used as nouns. Of particular interest was the low proportion of acceptable word meaning responses for sentence and paragraph items in which the unfamiliar word was an adjective. In so far as recognition of a need to use an

Table 7.2

Percentage Acceptable Meaning Responses by Form Class of Unfamiliar Word in U. F. W. Tests - Sentences and Paragraphs

Word Form Class	Grade 4 Sentences	Grade 4 Paragraphs	Grade 6 Sentences	Grade 6 Paragraphs	Grade 8 Sentences	Grade 8 Paragraphs
Noun[a]	84.03	69.44	70.83	81.94	75.00	82.64
Verb[a]	75.69	72.22	75.00	78.50	81.25	88.19
Adjective[b]	47.22	54.17	55.56	72.22	63.89	61.11

[a] N = 2

[b] N = 1

adjective as a synonym for the unfamiliar word required in the response, Ss appeared to have a limited number of problems as implied by the percentage accuracy of word form class, ranging from 83.33 per cent for grade 4 to 90.90 per cent for grade 8. (Table 7.1) It is possible that the level of conceptualization required by unfamiliar words such as piscatorial and perfunctory was beyond the stage of development of a number of the young Ss, even though the content of the passages in which the words were embedded tended to be, for the most part, familiar and within their experience. Results (Table 7.2) seemed to indicate that older Ss in grades 6 and 8, with from 55.56 per cent to 72.22 per cent acceptable word meaning responses, were somewhat better able to deal with the two abstract words (piscatorial and perfunctory) than were the grade 4 Ss, having from 47.22 to 54.17 per cent acceptable word meanings.

The tendency for the percentage accuracy of word form class (Table 7.1) and the percentage acceptable word meaning responses (Table 7.2) to be higher as the age level increased (i.e. from grade 4 to grade 8) could also be related to the difficulty level of certain words (nouns, verbs, or adjectives) used as part of the individual U. F. W. Tests by both younger and older Ss. In spite of attempts to maintain familiar content in a context containing an unfamiliar word such as ambergris, for example, results seemed to indicate that the attempts were not always successful. Older Ss tended to use considerable background knowledge concerning sperm whales, which they were able to bring to the reading situation when the unfamiliar word, ambergris, was presented in context. On the other hand, for a word such as limpet, younger Ss also made reference to the fisherman's need for "live fishing bait" being supplied by the "animals in the seashells", information brought to the task and not furnished by the context. The lower percentage acceptable word meaning responses for paragraph items than for sentence items by grade 4 Ss could probably be attributed to the difficulty level of the word ambergris. With so few test items contributing to the total number presented, these findings can, at best, report the degree of success achieved by the Ss in the study, attempting to process the meaning of unfamiliar words in context, on the basis of word form class.

Inflectional endings

Few errors were located in the specific word meaning elicited for an unfamiliar word in sentences or in paragraphs. In grade 4, two errors in verb inflections were found. Across the grades only 7 errors in verb tense were located in the explanation of word meaning. Errors in use of verb tense or inflections were not considered unless directly related to word meaning of the unfamiliar word; for example, if the S stated that Grandpa "is resting" when the context used the past tense for repose, an error in verb tense was counted.

Use of Semantic Information

Analysis of Ss' responses to the U. F. W. Tests - Sentences and Paragraphs was based upon words unfamiliar to each S. A list of the underlined, unfamiliar words which were used in the U. F. W.

Tests - Sentences and Paragraphs, presented to the Ss on the basis of the vocabulary pretest results, is placed in Appendix E.

The ten most frequently presented unfamiliar words (number of Ss responding to the item containing the word in parentheses) were as follows: lotus (33), stave (49), bewail (51), repose (42), ambergris (53), limpet (49), flaunt (50), recede (36), piscatorial (54), and perfunctory (51). Use of the ten remaining unfamiliar words ranged from one (homunculus) to sixteen (raze) times, for sentences and paragraphs.

Fourteen Ss were presented with the same five words for the sentence items (nine grade 4 Ss; two grade 6 Ss; and three grade 8 Ss); for paragraph the same five words were used by fifteen grade 4 Ss, six grade 6 Ss, and two grade 8 Ss. These findings tended to reflect the individual nature of the U. F. W. Tests - Sentences and Paragraphs.

Control of the language; word meaning responses

To determine whether there was a significant difference by group and by grade in ability to control the quality of the explanation or definition given for the unfamiliar words, the data were submitted to a two-way analysis of variance. A summary of the results follows.

In sentences

There were no significant main effects due to group ($F = 21.93$; $p = .06$) or to grade ($F = .73$; $p = .49$). Table 7.3 shows that, although there was no significant difference between groups, the

Table 7.3

Mean Word Meaning Scores U. F. W. Tests - Sentences by Group and by Grade

Grade	Reading Group	Sentences Mean	Sentences Variance
4	Very Proficient	14.67	9.87
	Proficient	14.33	9.07
	Less Proficient	15.00	1.60
6	Very Proficient	15.33	6.67
	Proficient	12.83	1.26
	Less Proficient	14.00	4.40
8	Very Proficient	17.50	4.70
	Proficient	15.00	4.00
	Less Proficient	12.83	9.37

Significant Sources of Variance	p*
Group	.06
Grade	.49
Group-Grade interaction	.18

* Significant at the .05 level

variance within groups was considerable. Furthermore, the tendency for the word meaning scores of the Less Proficient reading groups in grades 4 and 6 to be somewhat higher than were the word meaning scores of the Proficient reading groups may reflect one aspect of their potential to obtain word meaning from context. When required only to provide a general meaning for an unfamiliar word, they tended to be almost as able as the Very Proficient reading group in using the information given. When required, however, to call to mind precise meaning for well-established concepts, as was required in the F. W. Tests, they tended to be less efficient than were the Proficient reading groups. On the other hand, the Less Proficient grade 8 reading group revealed considerable variability, a tendency which seemed to prevail throughout the study and which may indicate also the negative influence of cumulative inability to use context efficiently.

In paragraphs

Main effects on word meaning scores for paragraph items due to groups were revealed (F = 6.44; p = .01). As shown in Table 7.4, the difference between mean word meaning scores of the Very Proficient and Less Proficient reading groups was significant at the .01 level, in favor of the Very Proficient reading groups. There was no significant difference between the mean word meaning scores of the remaining pairs of groups. However, inspection of Table 7.4 showed that the mean word meaning scores of the Very Proficient reading groups tended to be higher than were the mean word meaning scores of

Table 7.4

Mean Word Meaning Scores U. F. W. Tests - Paragraphs
by Group and by Grade

Grade	Reading Group	Paragraphs Mean	Paragraphs Variance
4	Very Proficient	15.00	1.08
	Proficient	14.33	3.47
	Less Proficient	12.17	1.86
6	Very Proficient	17.33	2.67
	Proficient	16.50	1.15
	Less Proficient	14.33	1.07
8	Very Proficient	18.17	5.67
	Proficient	16.00	1.60
	Less Proficient	14.33	6.67

Significant Sources of Variance	p
Group	.00**
Grade	.02*
Group-Grade interaction	.97

Scheffé Tests of Significance by Group	Very Proficient	Proficient	Less Proficient
Very Proficient		.41	.01**
Proficient			.09
Less Proficient			

Scheffé Tests of Significance by Grade	4	6	8
4		.06	.04*
6			.99
8			

* Significant at .05 level
** Significant at .01 level

the Proficient reading groups. Similarly, the mean word meaning scores of the Proficient reading groups tended to be higher than were the mean word meaning scores of the Less Proficient reading groups. In the context of a paragraph Ss tended to be able to obtain word meaning for increasingly difficult unfamiliar words with considerable skill.

Main effects due to grades were also revealed (F = 4.22; p = .02). The mean word meaning scores of grade 8 Ss were higher than were the grade 4 word meaning scores at the .05 level of significance. Grade 6 Ss seemed able to obtain word meaning from paragraphs with success similar to that of the grade 8 Ss (p = .99).

While the words in paragraphs tended to be more difficult than those presented in sentences, grade 4 Ss tended also to respond to words less difficult (limpet, flaunt, for example) than did the older Ss (philanthropy, raze, for example). Therefore, the means scores for paragraphs, like the mean scores for sentences, tended to represent the quality of the control over the language of the context which readers in grades 4, 6, and 8 demonstrated in obtaining the meaning of words unfamiliar to each S at each grade level.

Control of the language: qualitative levels of word meaning

Results from statistical treatment of the data revealed no significant differences between mean word meaning responses by group or by grade, for sentences; for paragraphs, a significant difference was revealed between the word meaning scores of grades 4 and 8. To examine more closely possible reasons for similarities and differences in word meaning responses, on the basis of the quality of the elicited word meaning, the percentage of word meaning responses placed in each of the four qualitative levels was determined by group and by grade.

For sentences, the percentage of mature word meaning responses (Level 1) was higher by group and by grade than was the percentage of word meaning responses placed in any one of the three remaining qualitative levels (Table 7.5). In grade 4, 44.44 per cent of the word meaning responses were placed in Level 1; 24.44 per cent in Level 2; 12.22 per cent in Level 3; and 18.89 per cent in the lowest qualitative level, Level 4. The proportion of Level 1 word meaning responses for grade 6 (56.67 per cent) and for grade 8 (66.67 per cent) tended to be higher than was reported for grade 4.

The Very Proficient reading groups tended to obtain a higher proportion of mature, precise word meaning responses than the Proficient and Less Proficient reading groups obtained: the proportion of Level 1 word meaning responses for grade 4 was 50.00 per cent, for grade 6, 56.67 per cent, and for grade 8, 66.67 per cent. Differences between the percentages of Level 1 word meaning responses for Proficient and Less Proficient reading groups were small (approximately 43 per cent acceptable responses for each group) in grades 4 and 6; in grade 8 the differences were slightly larger (Proficient reading group, 50.00 per cent; Less Proficient reading group, 43.33 per cent). Variance within groups and grades was considerable; in grade 4 the proportion of Level 1 word meaning responses ranged from 0 to 80 per cent; in grade 8 the range was

Table 7.5

Percentage Word Meaning Responses by Qualitative Levels: U. F. W. Tests - Sentences

		Level 1			Level 2			Level 3			Level 4		
Gr.	Reading Group	No.	Per Cent	Per Cent Range	No.	Per Cent	Per Cent Range	No.	Per Cent	Per Cent Range	No.	Per Cent	Per Cent Range
4	Very Proficient	15	50.00	20-80	7	23.33	20-60	1	3.33	0-20	7	23.33	0-60
	Proficient	12	40.00	0-60	8	26.67	0-60	4	13.33	0-0	6	20.00	0-40
	Less Proficient	13	43.33	20-60	7	23.33	0-40	6	20.00	0-40	4	13.33	0-80
	Total	40	44.44	0-80	22	24.44	0-60	11	72.22	0-40	17	18.89	0-80
6	Very Proficient	17	56.67	20-80	4	13.33	0-40	6	20.00	0-60	3	10.00	0-20
	Proficient	13	43.33	20-80	2	6.67	0-20	4	13.33	0-40	11	36.67	20-60
	Less Proficient	13	43.33	20-80	7	23.33	0-40	1	3.33	0-20	9	30.00	20-40
	Total	43	47.78	20-80	7	14.44	0-40	11	12.22	0-60	23	25.56	0-60
8	Very Proficient	20	66.67	40-100	6	20.00	0-40	3	10.00	0-20	1	3.33	0-20
	Proficient	15	50.00	20-80	7	23.33	20-40	3	10.00	0-20	5	16.67	0-40
	Less Proficient	13	43.33	0-60	2	6.67	0-20	4	13.33	0-20	11	36.67	20-60
	Total	48	53.33	0-100	15	16.67	0-40	10	11.11	0-20	17	18.89	0-60

even greater, from 0 to 100 per cent, indicating that some individuals were not able to elicit Level 1 word meaning responses. It appeared that within each reading group Ss were striving towards increased proficiency in obtaining the meaning of abstract, unfamiliar words.

The distribution of word meaning responses in all four levels revealed possible developmental trends in attempting to obtain word meaning from verbal context containing an unfamiliar word. The Very Proficient reading groups in grade 6 (10.00 per cent) and grade 8 (3.33 per cent) tended to give Level 4 word meaning responses less frequently than did the younger grade 4 Very Proficient reading group (23.33 per cent) and less frequently than did the Proficient and Less Proficient reading groups in their respective grade levels (i.e. from approximately 17 to 36 per cent).

The proportion of Level 3 word meaning responses across the grades tended to be approximately the same (12 per cent). The range of Level 3 word meaning scores , however, was wide (0 to 40 per cent in grade 4; 0 to 60 per cent in grade 6; and 0 to 20 per cent in grade 8), suggesting that some Ss within each grade and group seemed to experience considerable difficulty obtaining word meaning from context. From the standpoint of "making sense" to complete the meaning of the context, Level 3 word meaning responses were unacceptable. Nevertheless, Ss' responses seemed to indicate that Ss were struggling to obtain an acceptable meaning, since some meaning cues were identified but not integrated with the remainder of the context.

The proportion of Level 2 word meaning responses, acceptable yet less precise than Level 1 responses, tended also to be fewer and more variable by group and by grade. Grade 4 Ss tended to elicit Level 2 word meaning responses for slightly more than one half their acceptable word meaning responses (24.44 per cent); Ss in grades 6 and 8 tended to respond with Level 2 word meaning responses for less than one third of the acceptable responses (approximately 15 per cent), suggesting a possible developmental trend toward increased skill in abstracting meaning cues effectively for the purpose of generalizing in order to attain the meaning of an unfamiliar word. For paragraph items, the percentage of word meaning responses placed in each of the four qualitative levels was interesting. In the previous section, a significant difference was revealed between the mean word meaning scores of grades 4 and 8. According to Table 7.6, a lower percentage of grade 4 word meaning responses was considered mature (Level 1) quality (36.67 per cent) than was the percentage of grade 6 (54.44 per cent) and grade 8 (53.33 per cent) word meaning responses. Similar to the findings for word meaning responses for sentences, the proportion of Level 2 word meaning responses for grade 4 tended to be higher (30.00 per cent) than for grade 6 (21.11 per cent) or for grade 8 (25.56 per cent). It is possible that grade 4 Ss were unable to elicit Level 1 word meaning responses for paragraphs as frequently as was accomplished for sentences (44.44 per cent) because the unfamiliar words in paragraphs tended to be more difficult (i.e. more abstract). As a result, the grade 4 mean word meaning scores were significantly

Table 7.6

Percentage Word Meaning Responses by Qualitative Levels: U. F. W. Tests - Paragraphs

		Level 1			Level 2			Level 3			Level 4		
Gr.	Reading Group	No.	Per Cent	Per Cent Range	No.	Per Cent	Per Cent Range	No.	Per Cent	Per Cent Range	No.	Per Cent	Per Cent Range
4	Very Proficient	13	43.33	20-80	9	30.00	20-60	2	6.67	0-20	6	20.00	0-60
	Proficient	11	36.67	0-60	12	40.00	0-80	0	0.00	0-40	7	23.33	0-20
	Less Proficient	9	30.00	20-60	6	20.00	0-40	4	13.33	0-40	11	36.67	0-80
	Total	33	36.67	0-80	27	30.00	0-80	6	6.67	0-40	24	26.67	0-80
6	Very Proficient	18	60.00	40-80	10	33.33	20-60	2	6.67	0-20	0	0.00	0-0
	Proficient	18	60.00	20-100	3	10.00	10-20	5	16.67	0-60	4	13.33	0-40
	Less Proficient	13	43.33	20-80	6	20.00	0-40	5	16.67	0-20	6	20.00	0-60
	Total	49	54.44	20-100	19	21.11	0-60	12	13.33	0-60	10	11.11	0-60
8	Very Proficient	20	66.67	60-80	8	26.67	0-40	2	6.67	0-20	0	0.00	0-0
	Proficient	16	53.33	40-80	7	23.33	0-40	4	13.33	0-40	3	10.00	0-20
	Less Proficient	12	40.00	20-60	8	26.67	20-40	4	13.33	0-20	6	20.00	0-60
	Total	48	53.33	20-80	23	25.56	0-40	10	11.11	0-40	9	10.00	0-60

lower than were the grade 8's for paragraphs, but not for sentences.

The higher proportion of Level 4 word meaning responses for grade 4 (26.67 per cent) as compared to 10.00 per cent for grade 8 seemed also to reflect the difficulty some grade 4 Ss experienced with unfamiliar words in paragraphs.

That no significant differences were revealed between the mean word meaning scores of grades 4 and 6 for paragraphs might be attributed, in part, to the larger proportion of Level 3 word meaning responses for grade 6 (13.33 per cent) than for grade 4 (6.67 per cent). Grade 6 Ss, however, tended to control the quality of word meaning responses more efficiently than did the grade 4 Ss as revealed by the higher proportion of Level 1 word meaning responses (54.44 per cent as compared to 36.67 per cent for grade 4).

Quality of language control: five selected unfamiliar words (sentences)

Because few items represented each word form class (noun, verb, and adjective) in the *U. F. W. Tests - Sentences and Paragraphs*, no statistical treatment of the data relative to possible significant differences between grammatical classes was attempted. Instead, word meaning responses to five of the most frequently used unfamiliar words, representing three grammatical classes, were examined in terms of the quality of language control and expressed as percentages. Table 7.7 shows the percentage of word meaning responses to two nouns (*stave* and *lotus*), two verbs (*bewail* and *repose*), and one adjective (*piscatorial*).

For the word *lotus*, from 80 to 100 per cent of Ss' word

Table 7.7

Percentages: Word Meaning Responses to Five Selected Unfamiliar Words (U. F. W. Tests - Sentences) by Qualitative Levels

			Per Cent			
Word	Gr.	No. Ss.	Level 1	Level 2	Level 3	Level 4
lotus	4	17	82.35	5.88	5.88	5.88
	6	10	80.00	0.00	0.00	20.00
	8	6	100.00	0.00	0.00	0.00
stave	4	18	44.44	27.78	22.22	5.56
	6	16	50.00	12.50	18.75	18.75
	8	15	46.67	13.37	33.33	6.67
bewail	4	18	33.33	33.33	16.67	16.67
	6	15	53.33	13.33	20.00	13.33
	8	17	64.71	5.88	5.88	23.53
repose	4	14	50.00	50.00	0.00	0.00
	6	12	58.33	33.33	8.33	0.00
	8	15	60.00	40.00	0.00	0.00
piscatorial	4	11	18.18	9.09	27.27	45.46
	6	11	54.55	0.00	9.09	36.36
	8	9	55.56	0.00	11.11	33.33

meaning responses indicated a precise (Level 1) quality of language for the least difficult unfamiliar word (determined by its position on the original vocabulary test) in the U. F. W. Tests - Sentences. Unacceptable word responses tended not to be related to type of embedded contextual clue since unacceptable word meaning responses were based on Ss' attempts to obtain word meaning for five different types of contextual clues embedded in sentences.

For the second least difficult word presented in the U. F. W. Tests - Sentences, the word stave, considerable variability prevailed with respect to the quality of language control exhibited by Ss attempting to explain its meaning. Although almost one-half of the word meaning responses were considered precise, Level 1 word meaning responses, the proportion of word meaning responses considered unacceptable (Levels 3 and 4) ranged from low (5.56 per cent, Level 4, for grade 4) to high (33.33 per cent, Level 3, for grade 8).

Although bewail appeared on the Stanford-Binet Vocabulary Test before the word repose (i.e. considered less difficult), grade 4 Ss tended to obtain acceptable word meaning for repose (100 per cent) more frequently than for bewail (66.67 per cent). For Ss in grades 6 and 8, the proportion of Level 1 word meaning responses was slightly higher for bewail but the proportion of Level 2 word meaning responses (also acceptable) was considerably lower for bewail (13.33 per cent, grade 6; 5.88 per cent, grade 8) than for repose (33.33 per cent, grade 6; 40.00 per cent, grade 8), resulting in a lower proportion of acceptable word meaning responses for the less difficult word, bewail.

The adjective piscatorial tended to be too difficult for the majority of grade 4 Ss attempting to obtain its meaning from context. Although Ss in grades 6 and 8 seemed to obtain acceptable word meaning more efficiently, the proportion of Level 4 word meaning responses (approximately one-third) revealed a tendency for older Ss to have difficulty obtaining an acceptable meaning. The proportion of bizarre responses or no responses (Level 4) for grade 4 (45.46 per cent) was higher than was the proportion of Level 1 word meaning responses (18.18 per cent).

Quality of language control: five selected unfamiliar words (paragraphs)

As shown in Table 7.8, the easiest unfamiliar word limpet was given precise explanations by the majority of Ss responding to the paragraph item. The thirteen grade 8 Ss responding to the word limpet each provided a precise (Level 1) meaning. The proportion of grade 6 word meaning responses (N = 17) which demonstrated mature control of the language, as determined by their explanation of the word, was 94.12 per cent. The proportion of grade 4 Level 1 word meaning responses was lower (72.22 per cent) ~~but,~~ the additional 22.22 per cent of their responses (Level 2) considered acceptable although less precise, seemed to suggest that the younger Ss were coping with the task of completing the context effectively, considering their fewer years of linguistic and cognitive experience as compared to the older Ss.

For the more difficult unfamiliar word ambergris (i.e. in relation to its position in the original word list, the Stanford-Binet Vocabulary Test), word meaning responses were placed in each of the four qualitative levels, Levels 1 to 4. The proportion of elicited word meanings considered bizarre was fairly high for grade 4 (52.94 per cent) and for grade 6 (38.46 per cent), suggesting that these Ss seemed unable to relate the given meaning cues, consisting of more familiar words furnished by the context, to the unfamiliar word ambergris in order to reason its meaning. In grade 8 the word meanings elicited for ambergris by nine Ss were fairly well distributed in each category (22.22 per cent in each of three levels and 33.33 per cent in Level 3), which seemed to indicate that the older Ss experienced greater success in obtaining word meaning for an unfamiliar, difficult word. Moreover, the nine grade 8 Ss, not given the word ambergris in a paragraph item, had already met the word in a sentence item and were therefore presented with an even more difficult word in their paragraph item.

Of the 28 out of the 54 Ss attempting to obtain word meaning from the unfamiliar word perfunctory from the context of a paragraph, few were able to obtain a precise (Level 1) word meaning. In relation to the point of view expressed by the meaning cues (i.e. as interpreted by the majority of Ss), over 90 per cent of the responses were considered acceptable (Levels 1 or 2). It is interesting that the four Level 1 word meanings elicited were those of Ss with older brothers or who were themselves older and recalled their own childhood experiences relative to the distasteful task of "washing before dinner".

Table 7.8

Percentages: Word Meaning Responses to Five Selected Unfamiliar Words (U. F. W. Tests - Paragraphs) by Qualitative Levels

		No.	Per Cent			
Word	Gr.	Ss.	Level 1	Level 2	Level 3	Level 4
limpet	4	18	72.22	22.22	5.56	0.00
	6	17	94.12	0.00	5.88	0.00
	8	13	100.00	0.00	0.00	0.00
ambergris	4	17	17.65	11.76	17.65	52.94
	6	13	30.77	23.08	7.69	38.46
	8	9	22.22	22.22	33.33	22.22
flaunt	4	15	60.00	6.67	6.67	26.67
	6	12	75.00	0.00	8.33	16.67
	8	13	76.92	7.69	7.69	7.69
recede	4	18	38.89	38.89	0.00	22.22
	6	12	50.00	25.00	16.67	8.33
	8	6	100.00	0.00	0.00	0.00
perfunctory	4	11	0.00	90.90	0.00	9.00
	6	10	30.00	60.00	10.00	0.00
	8	7	14.29	85.71	0.00	0.00

Inspection of Table 7.8 revealed that Ss attempting to obtain word meaning for the unfamiliar words _flaunt_ and _recede_ were able to obtain acceptable word meaning (Levels 1 or 2) for the majority of their responses. It appeared that the meaning cues provided by the context were sufficiently familiar to make possible abstraction of meaning for an unfamiliar word.

Discussion: unacceptable word meaning responses

Word meaning responses, classified as unacceptable (Levels 3 and 4) in that Ss failed to complete the intended meaning of the context, were examined for the purpose of gaining information concerning possible reasons for problems associated with obtaining word meaning from the context. The following observations were made:

1. Responses placed in Level 3 revealed that Ss seemed to obtain some meaning related to the context. In most instances the meaning given tended to be implicit rather than explicit; for example, in attempting to explain the word _staves_:

Subject #7 - staves are a barrel (S able to abstract one meaning cue but tended to generalize too quickly without relating the parts to the whole).

Subject #32 - staves is sorta like . . . you put things together with little strips and so it has to be something made of wood and uh . . . (S abstracted a different meaning cue but was also unable to relate the "little strips", "something made of wood", to the other given cue the word "barrel", and from there generalize to the unfamiliar word "staves").

2. A second type of Level 3 word meaning response seemed to

stem from lack of adequate vocabulary; for example, in response to the word bewailed:

Subject #53 - felt . . . Well . . . they've uh . . . they've felt the loss of their pet each day so . . . .

Subject #7 - forget. Well, it got less . . . like . . uh . . . like something bad happens, usually each day it sorta gets less (possible reliance on personal experience).

It appeared that both Ss abstracted the meaning cue "loss of their pet", considered the possible effect upon the owners, and stated their responses in language familiar to the users, thereby conveying some meaning yet failing to communicate the full impact of the owners' loss (i.e. felt and forgot as opposed to mourned or cried). While the two Ss may never have owned a pet, there were other Ss who claimed no pet of their own ("my Mother doesn't like pets") but were able to complete the context with a precise meaning.

3. Inspection of other Levels 3 and 4 word meaning responses revealed a tendency, while attempting to define some unfamiliar words, to use familiar expressions, relevant or not; that is, Ss tended to use parts of the sentence which were meaningful to them but seemed unable to generalize further. For example,

Subject #35 - piscatorial - patience. Well, it says up here that Uncle Ambrose had patience and like . . . do the best . . . he had to learn to do exactly the same thing that Uncle Ambrose did . . .

The S was unable to go one step further and relate what it was that Uncle Ambrose did have -- fishing skill. With a difficult word such as piscatorial, some Ss appeared to be so skilled in the use of context that they verbalized, at least, a precise meaning for a word unfamiliar to them; other Ss, not so skilled, may have been fazed by the "big", unfamiliar word. As a result, they failed to make use of the most obvious meaning cues or, at least failed to relate them to the unfamiliar word; for example, in response to the word piscatorial, these responses were given:

Subject #54 - good. Well, he had amazing piscatorial skill -- that means he probably was quite good for his age or something.

In explaining how the sentence was read, Subject #54 stated: Once and then I looked at the word piscatorial a few times.

It appears that the S "looked at" the word but seemed not to have considered the relationship between the unfamiliar word and the embedded information leading to meaning located in the context.

In the context of a paragraph where meaning cues tended to be more obvious, Subject #49 gave the meaning "superior" for piscatorial because "he wanted to match that of his Uncle and his Uncle was an expert fisherman so he would have to be pretty good." It appeared that considerable meaning was obtained and, although "superior" was not a satisfactory meaning for piscatorial, it is possible that in a normal reading situation Subject #49 may have gained considerable meaning from the passage. When asked one additional question, "Good at what?", the prompt reply was "fishing".

4. Numerous examples were found where Ss gave peripheral meanings which became quite specific after one or more guided questions. For example, Subject #52 attempting to explain ambergris stated, "It doesn't last; it wears off. When it says 'they enjoy

its lasting pleasures', it doesn't last long." After being asked three additional questions, he was asked again to tell what the word meant. He replied, "Well, it's a waxy substance obtained from the body of the sperm whale; it makes the perfume last longer." It seemed that once given directed questions, Subject #52 (Less Proficient grade 8 reading group) was able to understand and explain what the word ambergris meant.

For comparison, the following responses to the same word are provided:

Subject #1 (Very Proficient grade 4 reading group) - Well, ambergris is a substance. It is a waxy substance. I think it helps keep the scent of perfume um . . . to last longer and it comes from the sperm whale.

Subject #29 (Proficient grade 6 reading group) - A waxy substance that is obtained from the sperm whale. It [ambergris] has the meaning in it. It's used in making perfumes.

The language power of both these proficient readers was in sharp contrast to that exhibited by less proficient readers across the grades, not only for the illustrated responses but for others, as well. Whether in grades 4, 6, or 8 some Ss experienced considerable difficulty in processing the meaning of unfamiliar words in context as evidenced by their inability to control the language of their word meaning responses.

Use of meaning cues

Results from the two-way analysis of variance revealed no significant main effects due to groups (F = 1.09; p = .35) or to grades (F = 2.25; p = .12), for sentences; that is, in obtaining word meaning for an unfamiliar word in sentences there was no significant difference across the grades in the mean number of meaning cues used (Table 7.9).

In paragraphs, there were no significant main effects due to grade (F = 2.54; p = .09). Main effects due to groups were revealed (F = 6.26; p = .00). Scheffé tests revealed a significant difference between the means of the Very Proficient reading group and the Less Proficient reading group ($p < .01$) in favor of the Very Proficient reading groups (Table 7.10).

Relationship between number of meaning cues and word meaning responses

Low positive (but not significant) coefficients of correlation between the number of meaning cues and qualitative word meaning scores on the U. F. W. Tests - Sentences were revealed in grade 4 (r = .32), in grade 6 (r = .43), and in grade 8 (r = .23) (Appendix I). Likewise, no significant relationships between the number of meaning cues and word meaning responses for paragraphs were revealed in grade 4 (r = .16) and in grade 8 (r = .36). In grade 6, however, a moderate significant coefficient of correlation between meaning cues and word meaning responses (r = .64) was revealed, suggesting that the more meaning cues the grade 6 Ss used, the higher were their scores. On the other hand, the same was not true for grade 8 Ss whose mean number of meaning cues and mean word meaning scores were not significantly different from those of grade 6. It

Table 7.9

Mean Number Meaning Cues in Ss' Responses to
U. F. W. Tests - Sentences

Grade	Reading Group	Sentences Mean	Sentences Variance
4	Very Proficient	8.50	5.10
	Proficient	7.67	1.87
	Less Proficient	7.50	1.90
6	Very Proficient	9.67	5.87
	Proficient	9.00	1.60
	Less Proficient	9.33	6.27
8	Very Proficient	9.50	5.10
	Proficient	9.00	2.80
	Less Proficient	7.83	8.17

Significant Sources of Variance	p*
Group	.35
Grade	.18
Group-Grade interaction	.91

* Significant at .05 level

Table 7.10

Mean Number Meaning Cues in Ss' Responses to U. F. W. Tests - Paragraphs

Grade	Reading Group	Paragraphs Mean	Paragraphs Variance
4	Very Proficient	10.83	17.37
	Proficient	8.50	6.33
	Less Proficient	10.00	3.20
6	Very Proficient	13.83	12.57
	Proficient	13.00	11.60
	Less Proficient	8.83	5.37
8	Very Proficient	12.83	5.37
	Proficient	9.67	16.67
	Less Proficient	9.00	7.37

Significant Sources of Variance	P
Group	.01**
Grade	.09
Group-Grade interaction	.18

Scheffe Test of Significance Between Groups

	Very Proficient	Proficient	Less Proficient
Very Proficient		.11	.01**
Proficient			.41
Less Proficient			

** Significant at .01 level

was, therefore, possible that grade 6 Ss were more stable in the selection of meaning cues to obtain the meaning of unfamiliar words in paragraphs than they were in selecting meaning cues for some of the other reading tasks.

These findings seemed to lend further support to what was stated previously concerning Ss' use of meaning cues in the F. W. Tests - Sentences and Paragraphs. Ss tended to vary in ability to abstract meaning cues from the context but factors other than the number of meaning cues abstracted seemed to influence their qualitative word meaning scores.

Use of single meaning cues

To determine the extent that the reported number of meaning cues which aided the Ss to obtain word meaning was a single meaning cue, a frequency count was made (similar to that done for the F. W. Tests). The percentage of acceptable word responses (Levels 1 and 2 combined) was calculated. Findings, shown in Table 7.11, revealed that the Less Proficient reading groups tended to use single meaning cues more frequently (for approximately 30 to 57 per cent of the responses) than did the Very Proficient and Proficient reading groups (for approximately 17 to 37 per cent) for sentence items. Only in grade 4, however, was the Less Proficient reading group as efficient in using single meaning cues as were the other two groups. Throughout the study, the responses of the grade 4 Less Proficient reading group (having within it at least two readers potentially very able readers, as determined by the criterion vocabulary score) revealed that this group tended, at times, to be

Table 7.11

Percentages: Attempted Word Meaning Responses and Acceptable Meaning Responses When Single Meaning Cues Used in U. F. W. Tests - Sentences and Paragraphs

		Sentences		Paragraphs	
Grade	Reading Group	% Attempted	% Acceptable	% Attempted	% Acceptable
4	Very Proficient	26.67	26.67	23.33	6.67
	Proficient	36.67	13.33	36.67	23.33
	Less Proficient	40.00	30.00	13.33	3.33
		34.44	23.33	24.44	11.11
6	Very Proficient	16.67	10.00	10.00	6.67
	Proficient	26.67	10.00	13.33	0.00
	Less Proficient	30.00	10.00	20.00	3.33
		24.44	10.00	14.44	3.33
8	Very Proficient	36.67	26.67	6.67	6.67
	Proficient	43.33	23.33	23.33	10.00
	Less Proficient	56.67	23.33	26.67	13.33
		45.56	24.44	18.89	10.00

proficient readers; at other times, they were less proficient than were the other two reading groups; that is, they tended to be less stable in their ability to use the meaning cues effectively.

For both sentences (24.44 per cent) and paragraphs (14.44 per cent) grade 6 Ss tended to base their responses on use of single meaning cues less frequently than did Ss in grade 4 (34.44 per cent and 24.44 per cent) and in grade 8 (45.56 per cent and 24.44 per cent) for sentences and paragraphs, respectively. There was a tendency for grade 6 Ss to use more meaning cues (the difference significant only in paragraphs) than did Ss in grades 4 and 8. It is possible that, during the transition from beginning intermediate (grade 4) to senior intermediate or upper elementary, grade 6 Ss were discovering that the "woods are full of verbal context (McCullough, 1958)." They tended, however, to be less efficient in the use of the meaning cues than were grade 8 Ss, whether using single meaning cues or several meaning cues to obtain word meaning from context.

In the larger context of a paragraph Ss in grades 6 and 8 tended to take fewer risks than did grade 4 Ss. The difficulty level of the unfamiliar words in paragraphs may, in part, be responsible for the lower proportion of single meaning cues used. Fewer responses on the basis of single meaning cues were attempted by the Very Proficient grade 8 reading group (6.67 per cent) than by any reading group across the grades. The findings seemed to indicate that the very proficient older readers, being more efficient in selection, realized when to risk their response on a single meaning cue (i.e. all their word meaning responses were acceptable). It was apparent, too, that grade 4 tended to attempt word meaning (24.44 per cent) on the basis of a single meaning cue more frequently than was profitable (11.11 per cent).

In general, across the grades there was a tendency for the Very Proficient reading groups to make the most efficient use of single meaning cues to obtain the meaning of an unfamiliar word in context.

Embedded meaning cues versus other meaning cues

Ss' revealed that embedded (E) and other (O) meaning cues were used by Ss responding to the U. F. W. Tests - Sentences and Paragraphs (as was reported for the F. W. Tests - Sentences and Paragraphs). Table 7.12 shows the mean number of embedded and other meaning cues used in sentences and in paragraphs by group and by grade. It is possible that the tendency for more other (O) meaning cues to be used in paragraphs than in sentences might be related to their availability in the larger context of paragraphs.

Reference to personal experience

Out of the total number of references to personal experience, 12 responses were related to highly personal experience, 7 references were made to school and related activities, and 47 references were made to experiences designated general (Table 7.13). Of particular interest were the following items related to Ss' references to personal experiences:

1. Reference to highly personal ("I" or "you" as subject) experiences was limited to responses to items containing words such

Table 7.12

Means: Embedded and Other Meaning Cues Used to Obtain Word Meaning U. F. W. Tests - Sentences and Paragraphs

Grade	Reading Group	Sentence Means Embedded	Sentence Means Other	Paragraph Means Embedded	Paragraph Means Other
4	Very Proficient	6.50	2.00	6.83	4.00
	Proficient	6.50	1.17	5.83	2.67
	Less Proficient	5.83	1.67	7.17	2.83
6	Very Proficient	7.67	2.00	9.50	4.33
	Proficient	7.00	2.00	9.33	3.67
	Less Proficient	5.83	2.00	6.17	2.67
8	Very Proficient	9.50	2.00	9.00	2.83
	Proficient	7.50	1.50	6.67	3.00
	Less Proficient	7.17	0.67	6.67	2.33

Table 7.13

Frequency of Reference to Personal Experience in Subjects' Responses U. F. W. Tests - Sentences and Paragraphs

	Type of Experience			
Grade	Highly personal	School	General	Total
4	1	2	16	19
6	6	2	19	27
8	5	3	12	20

as piscatorial (e.g. "When you're fishing you cast your line.") or perfunctory (e.g. ". . . and most of the time, I just wash, turn on the tap, slip my hands under it, turn it off, and I'm off"). Younger Ss tended to consider perfunctory related to a "good washing" probably because they believed that their hands were given a "good washing before going to the table," even though adults tend to consider their efforts to have been otherwise.

2. Few references were made to school activities. One reference was made to books by Subject #47 who recalled having read a book "on those things" (limpets).

3. The most frequent reference to general experience was made in responses to the following unfamiliar words: bewail (cats were familiar pets); staves (barrels seen at "grandpa's house" or "at Knott's Berry Farm"); lotus (water lilies seen "while canoeing in the north"; and repose ("easy chair in the living room to relax in" or "people rest after a meal").

4. Specific reference was made to personal experience in 9.26 per cent of the responses to the U. F. W. Tests - Sentences and Paragraphs (Reference was made to personal experience in 12.28 per cent of the responses to the F. W. Tests - Sentences and Paragraphs). It appeared that some Ss tended to draw upon personal experiences when explaining the meaning of unfamiliar words in much the same way that reference was made to personal experience in their attempts to call to mind a familiar word missing from the context.

Processing "time" reported for obtaining word meaning from context

According to Ss' reports, efforts to obtain the meaning of an unfamiliar word from the context of sentences and paragraphs required different processing "times", similar to that which was reported for the F. W. Tests - Sentences and Paragraphs.

In sentences

Across the grades the most frequently reported processing "time" for obtaining an acceptable word meaning was "at the end of first reading" (comparable to the findings for familiar words). Table 7.14 shows that acceptable word meanings were obtained "at the end of first reading" by grade 4 for 41.11 per cent of their responses; by grades 6 and 8, for 37.78 per cent of their acceptable word meaning responses. The percentage of reported attempts to obtain word meaning "at the end of first reading" was highest for grade 4 (61.11 per cent) and lowest for grade 8 (46.67 per cent); that is, when grade 8 Ss attempted to obtain word meaning "at the end of first reading," they obtained an acceptable word meaning for approximately 80 per cent of their attempts as compared to approximately 67 per cent acceptable responses for grades 4 and 6. Since the difficulty level of the unfamiliar words tended to increase by grade, the tendency for increased efficiency in obtaining word meaning seemed apparent.

For grade 4 Ss, the second most frequently reported processing "time" was "during second reading" (14.44 per cent) with only slight variation by groups. With respect to proportion of

Table 7.14

Percentages Word Meaning Responses: Reported and Acceptable in Relation to Reported Processing "Times" for U. F. W. Tests - Sentences

Gr.	Reading Group	During 1st Reading		End 1st Reading		During 2nd Reading		End 2nd Reading		3 or more Readings		No. Responses
		% Reported	% Acceptable	% Reported	% Acceptable	% Reported	% Acceptable	% Reported	% Acceptable	% Reported	% Acceptable	% Omitted
4	Very Proficient	3.33	3.33	66.67	43.33	13.33	10.00	10.00	10.00	6.67	6.67	0.00
	Proficient	6.67	6.67	70.00	50.00	16.67	10.00	3.33	0.00	0.00	0.00	3.33
	Less Proficient	3.33	3.33	46.67	30.00	13.33	10.00	6.67	3.33	23.33	20.00	6.67
	Total	4.44	4.44	61.11	41.11	14.44	10.00	6.67	4.44	10.00	8.89	3.33
6	Very Proficient	23.33	20.00	56.67	33.33	6.67	6.67	10.00	6.67	3.33	3.33	0.00
	Proficient	16.67	6.67	53.33	33.33	16.67	10.00	6.67	0.00	3.33	0.00	3.33
	Less Proficient	6.67	3.33	60.00	46.67	6.67	3.33	6.67	3.33	20.00	6.67	0.00
	Total	15.56	10.00	56.67	37.78	10.00	6.67	7.78	3.33	8.89	3.33	1.11
8	Very Proficient	13.33	10.00	66.67	63.33	6.67	3.33	6.67	3.33	6.67	6.67	0.00
	Proficient	13.33	13.33	43.33	26.67	6.67	6.67	26.67	20.00	10.00	6.67	0.00
	Less Proficient	16.67	10.00	30.00	23.33	10.00	3.33	16.67	6.67	20.00	6.67	6.67
	Total	14.44	11.11	46.67	37.78	7.78	4.44	16.67	10.00	12.22	6.67	2.22

acceptable meaning responses (10 per cent), consistency within the grade was apparent. Ss in grades 6 and 8 tended to report obtaining word meaning "during second reading" less frequently than did the grade 4 Ss.

By contrast, Ss in grade 6 (15.56 per cent) and in grade 8 (14.44 per cent) tended to report obtaining word meaning for an unfamiliar word "during first reading" more frequently than did the grade 4 Ss (4.44 per cent). However, grade 4 Ss appeared to be certain (100 per cent accuracy) before taking a chance on partial reading of the sentence to obtain word meaning. Differences between grade 6 and grade 8 varied slightly, both in reporting word meaning obtained "during first reading" (14.44 and 15.56 per cent) and in proportion of acceptable meaning responses (10.00 and 11.11 per cent, grades 6 and 8 respectively). There was, however, considerable variance within each grade, suggesting that some individuals were more efficient in rapid processing of meaning than were other individuals who, by extending the processing, seemed to obtain word meaning successfully.

Ss across the grades tended to report reading a considerable number of sentences more than once before the word meaning was called to mind. For grade 4 Ss the proportion of more than one reading processing "times" varied from a high average of 14.44 per cent (10.00 per cent acceptable) for "during second reading" to a low average of 6.67 per cent (4.44 per cent acceptable) for "end of second reading." For grades 6 and 8 somewhat lower proportions for more than one reading to obtain word meaning were reported but the patterns tended to be similar to those reported for grade 4.

Variability in processing "time" was reflected by groups across the grades. The Very Proficient reading groups tended to adjust the processing of the passage in relation to the extent of reading required to obtain word meaning from the context with considerable efficiency. For example, the Very Proficient reading group in grade 8 reported obtaining word meaning "during first reading" for 10.00 per cent of their acceptable (Levels 1 or 2) responses with 13.33 per cent attempted; for "end of first reading" 63.33 per cent of their responses were acceptable and 66.67 per cent were attempted; for "three or more readings" only 6.67 per cent were attempted but all were acceptable. While the proportion was somewhat lower for grades 4 and 6 the patterns of processing "times" and subsequent successes tended to be similar to those reported for grade 8.

Reported processing "time" by Proficient and Less Proficient reading groups tended to reflect their attempts to be flexible in dealing with abstract symbols; that is, they reported use of five processing "times". Proficiency in the reading process varied. At times Ss were highly successful; at other times they were unsuccessful. The Proficient grade 8 reading group, for example, tended to be most efficient for "during first reading" (13.33 per cent attempted and 13.33 per cent acceptable) and "end of second reading" (26.67 per cent attempted and 20.00 per cent acceptable). They tended to be least efficient for "end of first reading" (43.33 per cent attempted and only 26.67 per cent acceptable).

The reported processing "times" of the Less Proficient reading groups are interesting. Across the grades, three or more readings of sentences were reported for at least 20.00 per cent of the items. The proportion of acceptable word meaning responses for grade 4 was high (20.00 per cent out of 23.33 per cent attempted). For grades 6 and 8 only 6.67 per cent of the responses attempted after three or more readings were acceptable. It is possible that the younger Less Proficient reading group attempted to use what skill they had in an effort to obtain the meaning of an unfamiliar word in the context, even though three or more readings were necessary to complete the task. By contrast, the older Less Proficient readers tended to suffer from the cumulative effects of lack of skill in synthesizing and integrating the meaning cues abstracted from the context of sentences.

There were times, however, when the Less Proficient reading groups seemed to be successful; for example, in grade 6, where the reported processing "time" was "end of first reading," for 60.00 per cent of their responses with 46.67 per cent acceptable, the accuracy level was higher than that of the Proficient and Very Proficient reading groups. These results seemed to indicate that the Less Proficient reading groups (potentially able readers) were, in some reading situations, proficient. On the whole, however, they tended not to have developed the same level of proficiency demonstrated by the Proficient and Very Proficient reading groups.

In paragraphs

For the five paragraph items on the U. F. W. Test, one half or more of the Ss' responses were elicited "during the first reading" or "at the end of the first reading" (Table 7.15). The level of efficiency, as determined by the proportion of acceptable word meanings in relation to the proportion of attempted word meanings, tended to be higher for paragraphs than was the level of efficiency for sentences.

Ss in grades 4 and 6 tended to be equally successful in processing word meaning "at the end of first reading" (30 per cent of total responses). The larger proportion of acceptable "during first reading" word meanings reported by grade 6 Ss (21.11 per cent out of 26.67 per cent attempted) than by grade 4 Ss (7.78 per cent out of 8.89 per cent attempted) seemed to suggest that the grade 6 Ss tended to be better able, for some reading tasks, to reduce uncertainty rapidly by way of abstracting the essential meaning cue(s) and deciding upon the appropriate relationships between the cues and the unfamiliar word more frequently than was possible for the younger grade 4 Ss. On the other hand, the grade 4 Ss were proficient in that they seemed to realize when it was appropriate for them to decide upon an appropriate word meaning "during first reading" as judged by the high level of accuracy (out of 8.89 per cent attempted, 7.78 per cent of the responses were accurate). Inspection of Table 7.15 revealed considerable variability in the remaining processing "times" within each grade. In grade 8 there was 100 per cent accuracy in obtaining word meaning for 12.22 per cent of the responses for which meaning was obtained "during the first reading." For these items, it appeared that the thinking part of the reading process was so efficient that only a portion of the words in the context was required to obtain the meaning of the unfamiliar word.

The Very Proficient reading group in grade 8 reported all processing was completed "during the first reading" or by the "end of the first reading." For the same group in grade 6, all processing was reported as being completed with no more than two readings of any paragraph. At the grade 4 level, all "times" were reported as useful and effective in obtaining the meaning of an unfamiliar word in a paragraph. On the whole, less processing was required to read the paragraphs by the Very Proficient reading groups than by the Proficient and Less Proficient reading groups.

Differences in processing "time" required to obtain the meaning of unfamiliar words in paragraphs tended to vary somewhat within groups as well as by grades. Grade 8 Ss tended to obtain more acceptable word meanings with less processing "time" required than was reported by either grades 4 or 6. Furthermore, at grade 8 level, the Very Proficient reading group was consistently the most proficient reading group, having obtained all word meanings "during first reading" or at the "end of first reading" with a high degree of accuracy. The Proficient reading group also tended to obtain as many word meanings or more than the Less Proficient reading groups for all reported processing "times". In grades 4 and 6, however, there appeared to be less consistency in processing ability by groups. In grade 6, for example, the Less Proficient reading group obtained

Table 7.15

Percentages Word Meaning Responses: Reported and Acceptable in Relation to Reported Processing "Times" U. F. W. Tests - Paragraphs

Gr.	Reading Group	During 1st Reading		End 1st Reading		During 2nd Reading		End 2nd Reading		3 or more Readings		No. Responses
		% Reported	% Acceptable	% Reported	% Acceptable	% Reported	% Acceptable	% Reported	% Acceptable	% Reported	% Acceptable	% Omitted
4	Very Proficient	6.67	6.67	66.67	40.00	16.67	16.67	6.67	6.67	3.33	3.33	0.00
	Proficient	10.00	10.00	36.67	33.33	26.67	20.00	23.33	13.33	0.00	0.00	3.33
	Less Proficient	10.00	6.67	23.33	16.67	10.00	0.00	10.00	3.33	36.67	23.33	10.00
	Total	8.89	7.78	42.22	30.00	17.78	12.22	13.33	7.78	13.33	8.89	4.44
6	Very Proficient	36.67	36.67	30.00	30.00	26.67	23.33	6.67	3.33	0.00	0.00	0.00
	Proficient	26.67	16.67	36.67	26.67	26.67	20.00	6.67	6.67	3.33	0.00	0.00
	Less Proficient	16.67	10.00	43.33	33.33	30.00	20.00	0.00	0.00	6.67	0.00	3.33
	Total	26.67	21.11	36.67	30.00	27.78	21.11	4.44	3.33	3.33	0.00	1.11
8	Very Proficient	16.67	16.67	83.33	76.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Proficient	10.00	10.00	60.00	43.33	10.00	6.67	6.67	6.67	13.33	10.00	0.00
	Less Proficient	10.00	10.00	46.67	36.67	10.00	6.67	16.67	6.67	6.67	6.67	10.00
	Total	12.22	12.22	63.33	52.22	6.67	4.44	7.78	4.44	6.67	5.56	3.33

acceptable word meaning at the "end of first reading" for 33.33 per cent (43.33 per cent attempted) as compared to the Proficient reading group who obtained 26.67 per cent acceptable word meanings (36.67 per cent attempted) at the "end of first reading." In grade 4, the Proficient reading group attempted to obtain word meaning for 10.00 per cent of their responses as compared to 6.67 per cent (both 100 per cent accuracy) for the Very Proficient reading group. Likewise, the Very Proficient reading group reported three or more readings for a limited number of paragraph items (3.33 per cent) while the Proficient reading group reported none and the Less Proficient reading group required three or more readings for a considerable proportion of their responses (36.67 per cent). While there was a tendency for the Less Proficient reading group, in particular, to experience some word recognition problems with the unfamiliar words (pronounced for them as soon as the need was recognized), the "time" required to process the context (i.e. reread the context in order to interpret the passage and decide upon a meaning for the unfamiliar word) tended to be more extensive for this group than for the Proficient and Very Proficient reading groups.

Processing "time" for four selected unfamiliar words

Of the individual unfamiliar words presented to Ss in sentences, stave and bewail were most frequent. To examine the processing "time" (i.e. the extent of reading done when meaning reportedly came to mind) used by Ss responding to these two items, a frequency count of acceptable word meaning responses was made.

Since each underlined, unfamiliar word was represented in five sentences, each sentence having embedded in it at least one of the five selected contextual clues, the tendency to use more or less processing "time" was probably related to the type of sentence randomly chosen for a particular S. Within those limitations, Table 7.16 shows the variation in reported processing "time" by group and by grade for two unfamiliar words, bewail and stave.

Since the same paragraphs containing the words limpet and flaunt (two of the most frequently presented paragraph items) were presented to all Ss for whom the words were unfamiliar, problems of different sentence types were removed. The frequency of reported processing "time" (Table 7.16) revealed tendencies for considerable variation in processing "time" similar to that shown for the words stave and bewail.

The one grade 6 S reporting word meaning for limpet "during first reading," stated that the main cue, "seashells", was used only to confirm what was previously determined from the preceding meaning cues. The majority of Ss, however, reported that meaning came immediately after reading "seashells". Some reported that other meaning cues helped them; some tended to rely only on "seashells".

The eight Ss obtaining word meaning for flaunt during first reading either knew what the word meant "as soon as I read 'with an air of superiority'" (in spite of some Ss not being able to pronounce superiority, meaning was apparent) or the meaning cue ("with an air of superiority") confirmed what was reflected in the girl's actions. For other Ss, however, the meaning of the word flaunt tended to come to

Table 7.16

Reported Processing "Times": Acceptable Responses to Four Selected Unfamiliar Words U. F. W. Tests - Sentences and Paragraphs

Processing "Times"	Reported Responses by Grades											
	"stave"			"bewail"			"limpet"			"flaunt"		
	4	6	8	4	6	8	4	6	8	4	6	8
During 1st reading	0	3	0	1	3	2	0	1	1	3	2	3
End 1st reading	5	3	5	8	3	6	10	12	9	2	6	1
During 2nd reading	2	3	2	2	3	2	0	2	3	0	1	4
End 2nd reading	3	1	2	0	1	1	5	1	0	5	0	2
3 or more readings	3	0	1	1	0	2	2	0	0	0	0	0

mind after the reading was completed with some reporting "thinking" about the word or "staring at it."

In other words, although patterns of similarity in processing "time" was determined from the responses, there was also a tendency for individuals to bring their own processing "style" to the reading task of obtaining word meaning for an unfamiliar word in context.

Summary: processing *F. W. Tests* and *U. F. W. Tests*, sentences and paragraphs

By inspection, the following observations were made in relation to processing "time" reported for acceptable familiar words missing from the context and for unfamiliar word underlined in the context:

1. Whether completing the context of a sentence or paragraph with a familiar missing word or an unfamiliar underlined word, Ss across the grades tended to process the context only once for a larger proportion of acceptable word responses than was reported for any other processing "time". It appeared that Ss tended to assimilate the meaning cues while reading the context for the first time by accommodating the new idea obtained from them (the unknown word) into the environment of the sentence or paragraphs to "make sense" of the concept. This technique, however, was not the only one used by developing readers in grades 4, 6 and 8.

2. There was a tendency for the level of efficiency for each reported processing "time" to vary: for the *U. F. W. Tests - Sentences* the acceptability of meaning responses for the five reported processing "times" ranged from 100 per cent to 0 per cent

for sentences and for paragraphs; for the F. W. Tests - acceptability of processing "time" for familiar word responses ranged from approximately 87 per cent to 36 per cent for sentences. For paragraphs, the range of acceptability for familiar word responses processed during the five reported "times" tended to range from 100 per cent to 0.0 per cent accuracy. That is, for both tasks, obtaining a familiar word missing from the context or getting the meaning of an unfamiliar underlined word in the context, there was considerable variance across the grades in the efficiency (i.e. accuracy) with which processing "time" was used.

3. At the grade 8 level, approximately one half of the acceptable responses for the F. W. Tests and the U. F. W. Tests for sentences was reported as being obtained "during the first" or "at the end of the first reading." By contrast, Ss in grades 4 and 6 tended to report acceptable word meaning for the U. F. W. Test "during the first" or "at the end of the first reading" for between 40 to 50 per cent of their responses. However, they tended to require more processing "time" to achieve the same proportion of acceptable word responses for familiar words missing from the context. It appeared that calling to mind a word missing from the context (even though familiar) tended to require more processing (i.e. reading) than was required for determining the meaning of an unfamiliar underlined word in the context. Although the reasons for the differences in processing requirements were not determined in this study, it appeared that the two tasks may have required different abilities in addition to sharing certain common tendencies.

4. There was a tendency, across the grades, for Ss to report less processing "time" for paragraphs than for sentences in both the F. W. Tests and the U. F. W. Tests; that is, although the sentences contained fewer words than did the paragraphs, there was a tendency for Ss to process (read) the context of the sentences more extensively (or intensively) than the context of a paragraph. The main concern with processing "time" was not for how long the Ss required to obtain word meaning but how much reading (i.e. decoding and thinking) was required to complete the meaning of the context as determined by Ss' responses.

Rereading to check meaning and "make sure"

Across the grades the tendency to reread passages of the U. F. W. Tests - Sentences and Paragraphs varied (Table 7.17). Sentences tended to be reread more frequently by grade 4 (25.56 per cent) than by grade 6 (16.67 per cent) or by grade 8 (20.00 per cent). Paragraphs were reread more consistently across the grades -- for approximately one quarter of the items. Within the grades the variability previously reported for reading the passages was revealed also in reported rereading to check meaning; for example, the Proficient grade 4 reading group tended to check for the purpose of making sure less frequently (for no more than 10 per cent of the items) than did the Very Proficient reading group (for 30 per cent or more), or the Less Proficient reading group (for up to 33 per cent of the items). In grade 6, however, the Less Proficient reading group tended to check for meaning most frequently (from 27 to 33 per cent) and the Very Proficient reading group the

Table 7.17

Percentages: Rereading to Check Meaning in U. F. W. Tests - Sentences and Paragraphs

Reading Group	Grade 4 Sentences	Grade 4 Paragraphs	Grade 6 Sentences	Grade 6 Paragraphs	Grade 8 Sentences	Grade 8 Paragraphs
Very Proficient	36.67	30.00	10.00	20.00	20.00	23.33
Proficient	6.67	10.00	13.33	26.67	26.67	33.33
Less Proficient	33.33	26.67	26.67	33.33	13.33	16.67
Total	25.56	22.22	16.67	26.67	20.00	24.44

least frequently (from 10 to 20 per cent).

The variability in Ss' reported rereading to "make sure" may, in part, be related to the variation in reported processing "time" with the possibility that both were related to the individual nature of the U. F. W. Tests - Sentences and Paragraphs; that is, the individual items presented to one S may have required more rereading to "make sure" because they were more difficult than the items presented to another S. It might be, for example, one reason why the Very Proficient grade 4 reading group tended to check meaning more frequently than either the Proficient or Less Proficient reading groups checked to "make sure". On the other hand, checking to "make sure" that the meaning of the context was complete seemed to be one attribute of a proficient reader.

Comments from Ss, such as the following, seemed to imply that rereading of some passages was unnecessary:

Subject #39 (ambergris) - . . . I remembered.

Subject #4 (lotus) - Well, it says so on the card.

Subject #24 (piscatorial) - I read that once because as soon as I got to "catch fish," I had it.

Findings: Intellectual Approach to the Task

Use of reasoning

On the basis of the Ss' explanations of why particular word meanings were given for the underlined unfamiliar words in the context, the quality of the reasoning was determined. The criteria developed for analysis of the F. W. Tests - Sentences and Paragraphs were applied to Ss' responses to the U. F. W. Tests - Sentences and Paragraphs. The reasoning inferred from each response was judged as good, fair, or faulty with appropriate numerical value attributed to each response. Statistical treatment of the data was then applied.

The following examples of Ss' responses were included to illustrate good, fair and faulty reasoning:

a) Good reasoning -

Subject #21 - piscatorial - fishing. Well, it says the "ability to catch fish with considerable success." If you can do something with success, it's a skill. And it says "fish", so fishing would have to be the skill because you catch fish.

Subject #42 - razed- destroyed. Well, they did something to the "finest cities" and then they had to rebuild them so they must have destroyed them.

b) Fair reasoning -

Subject #9 - bewailed - they were sad, they couldn't get it off their minds. It says "they mourned when their pet cat died and they were very sad about his death for a long long time." Like they were sad.

Subject #44 - repose means to sit back and relax. It was after dinner and after dinner you don't feel like doing much and it's in an easy chair and it's by the fireplace and that would make it cozy and all that.

Responses placed in the fair reasoning category tended to rely upon experience, often to the neglect of the main given cue. The responses, however, indicated the Ss' attempt to justify choices made in terms of stating or implying relationships between the unfamiliar word and parts of the context.

c) Faulty reasoning -

Subject #14 - ambergris - perfume . . . 'Cause most "women love perfume". (Limited use of meaning cues; wrong conclusion drawn.)

Subject #28 - ambergris - something made from the sperm whale. And "it keeps the scent of orange blossoms and other spicy flowers". (Missed key meaning cues; therefore, unable to relate the parts abstracted to the whole.)

Subject #51 - perfunctory - thorough. It says, a washing before he appeared at the table. He must have . . . it says a "mechanical, disinterested wetting" . . . maybe he was a mechanic and his hands were greasy and he didn't care about his hands but he did. (Inability to relate meaning cues abstracted; confused and unable to synthesize the given information.)

Results from the two-way analysis of variance yielded the following information concerning Ss' ability to reason in the U. F. W. Tests - Sentences and Paragraphs.

In sentences

Main effects due to groups (F = 4.87; p = .01) were revealed. Scheffé tests revealed a significant difference between mean reasoning scores of the Very Proficient and Less Proficient reading groups ($p < .05$) in favor of the Very Proficient reading group (Table 7.18). The mean reasoning scores of the Proficient reading groups were not significantly different from the mean reasoning scores of the Very Proficient and Less Proficient reading groups but tended to vary

Table 7.18

Mean Reasoning Scores (N = 10) U. F. W. Tests - Sentences

Grade	Reading Group	Sentences Mean	Sentences Variance
4	Very Proficient	5.33	1.03
	Proficient	4.17	7.37
	Less Proficient	4.50	2.30
6	Very Proficient	5.00	2.80
	Proficient	2.67	5.87
	Less Proficient	2.33	1.07
8	Very Proficient	7.00	4.80
	Proficient	5.00	4.80
	Less Proficient	2.83	6.57

Significant Sources of Variance	p
Group	.01**
Grade	.13
Group-Grade interaction	.48

Scheffé Tests of Significance Between Groups

	Very Proficient	Proficient	Less Proficient
Very Proficient		.07	.02*
Proficient			.83
Less Proficient			

* Significant at the .05 level
** Significant at the .01 level

considerably within the group, suggesting that some Ss within the Proficient reading group tended to be more able to reason than were other Ss in the same group.

There was no significant difference in mean reasoning scores by grade. These results seemed to suggest that when the unfamiliar words were placed in simply structured sentences containing familiar context (other than the unfamiliar word), Ss across the grades seemed able to combine reasoning power and language power, independent of age or grade level. Since aid was given to Ss unable to pronounce any unfamiliar words in the context (e.g. superiority, ornamental), it was considered unlikely that word recognition problems deterred reasoning. On the contrary, some Ss seemed to understand the meaning of some words which they were unable to pronounce (e.g. superiority) and tended to rely upon them as aids to completing the meaning of the context.

In paragraphs

Main effects due to groups ($F = 8.58$; $p = .00$) were revealed (Table 7.19). The mean reasoning scores of the Very Proficient reading groups were significantly higher than were the mean reasoning scores of the Less Proficient reading groups ($p < .001$). There was no significant difference between mean reasoning scores of the Proficient and Less Proficient reading groups. In each grade, the Proficient reading groups tended not to reason as well as the Very Proficient reading groups. On the other hand, they tended to reason somewhat more efficiently than did the Less Proficient reading groups in order to obtain the meaning of an unfamiliar word

Table 7.19

Mean Reasoning Scores (N = 10) U. F. W. Tests - Paragraphs

Grade	Reading Group	Paragraphs Mean	Paragraphs Variance
4	Very Proficient	4.83	1.14
	Proficient	4.50	4.30
	Less Proficient	2.00	6.00
6	Very Proficient	7.00	3.60
	Proficient	4.50	1.07
	Less Proficient	3.67	1.11
8	Very Proficient	7.33	1.47
	Proficient	5.17	2.17
	Less Proficient	3.17	5.37

Significant Sources of Variance	p
Group	.00***
Grade	.18
Group-Grade interaction	.80

Scheffé Tests of Significance Between Groups

	Very Proficient	Proficient	Less Proficient
Very Proficient		.15	.00***
Proficient			.11
Less Proficient			

*** Significant at .001 level

from context.

There were no significant differences in mean reasoning scores by grade. Variance within each grade, however, was considerable, suggesting that some Ss tended to reason the meaning of unfamiliar words in paragraphs more efficiently than did other Ss in the same grade.

It was shown previously that the processing "time" required by the grade 4 Ss tended to be more extensive (i.e. more reading of the context as opposed to less reading) than was the processing "time" reported by Ss in grades 6 and 8. Given the opportunity to think about the reading task, which provided specifically embedded meaning cues, the younger grade 4 Ss seemed able to reason and make judgments concerning relationships between the unfamiliar word and the remaining context with reasoning power that was not significantly lower than the reasoning power generated by older Ss in grades 6 and 8.

Comparison: reasoning scores in sentences and paragraphs

To determine whether or not there was a significant difference between mean reasoning scores for sentences and paragraphs by grade, correlated t tests were applied to the data (Table 7.20). Results were as follows:

For grade 4 ($t = 1.01$; $p = .33$) and for grade 8 ($t = -0.49$; $p = .63$) there was no significant difference between mean reasoning scores for sentences and paragraphs. That Ss in grades 4 and 8, given unfamiliar words in the context of sentences or paragraphs,

Table 7.20

Correlated t Tests: Mean Reasoning Scores[a] U. F. W. Tests - Sentences and Paragraphs

	Sentences		Paragraphs			
Grade	Mean	S.D.	Mean	S.D.	t	p
4	46.67	24.04	37.78	27.60	1.01	.33
6	33.33	26.03	50.56	30.09	-2.22	.04*
8	49.44	27.18	52.22	23.23	-0.49	.63

[a] Converted to percentages

*Significant at .05 level

could reason the meaning of the unfamiliar word with comparable success, was indicated by these results.

For grade 6, a significant difference between mean reasoning scores for sentences and paragraphs ($t = -2.22$; $p = .04$) was revealed. Although the results were in favor of paragraphs, the difference was approaching non-significance at the .05 level. It is possible that grade 6 Ss tended to reason less successfully in sentences because of the difficulty level of some unfamiliar words presented in sentence items. It appeared that some grade 6 Ss who may not have been cognitively ready to comprehend difficult concepts, tended to operate more successfully when the test item consisted of an unfamiliar word in the context of a paragraph rather than in a sentence. The mean reasoning scores for paragraphs ($\overline{X} = 50.56$; S. D. = 30.09) were only slightly different from the mean reasoning scores of grade 8 ($\overline{X} = 52.22$; S. D. = 23.23), suggesting that, given the unfamiliar word in the context of paragraphs, grade 6 Ss tended to reason the meaning of the unfamiliar word more like grade 8 Ss than like the younger grade 4 Ss ($\overline{X} = 37.78$; S. D. = 27.60). Throughout the study, findings seemed to suggest that the grade 6 Ss were less consistently stable in their approach to reading tasks than were either grade 4 or grade 8 Ss. In some instances, grade 6 Ss tended to operate more like grade 4 Ss; in other instances, they tended to reason and use language more like grade 8 Ss. As shown by the large standard deviations across the grades, Ss within each grade tended to vary considerably in their ability to reason the meaning of unfamiliar words from the context of sentences and paragraphs.

Observations: during the interviews and from the protocols

The following observations were made from Ss' responses to the U. F. W. Tests - Sentences and Paragraphs:

1. Most Ss tended to approach the task of attempting to obtain word meaning for unfamiliar words, which they so recently admitted not knowing, with considerable trepidation. The younger Ss, in particular, either because they tended to be more verbal in expressing their feelings or because the unfamiliar words seemed especially formidable, stated or implied by their actions that they feared they would be unable to complete the tasks.

2. At first, Ss tended to be quite amazed to realize that they were able to obtain word meaning from the context for such unfamiliar words. Even the most reticent tended to relax and enjoy the experience of obtaining word meaning for some rather difficult unfamiliar words. It is possible, however, that the Ss tended to feel more confident because the U. F. W. Tests were presented during the last half of the second interview when both S and investigator were better acquainted than they were when the F. W. Tests - Sentences and Paragraphs were completed.

Comments such as the following were made by younger Ss: "I thought it must mean 'member of the water lily family' but then again, you know, I thought that it would be just too easy, like to get the definition of the word but . . . " or "I thought it wouldn't do that in a sentence. It just gave the word away." Even for a difficult word such as piscatorial, the comment was, "It was easy."

3. Some Ss' responses suggested that considerable thought was given to the responses; for example, "I stopped and thought about it"; "I just thought a little while and it came to me"; or "I got my first idea when it said . . . ." An attempt was made to ask Ss to explain what their "thoughts" were but little additional information was gained. The best information was obtained when the explanation concerning the thinking came spontaneously from the responses of a limited number of highly verbal Ss. For example, Subject #42 explained how he thought about the word philanthropy by saying, "I read the whole thing and then I thought, 'What was he?' He was a generous person." Similarly, Subject #20 reported, "I read it once. I guess I thought of it afterwards. I said, 'a large number of fish' and then he had 'great piscatorial skill' and I thought, 'What type of skill?' and then I looked back and saw 'fishing'."

4. Because of the individual nature of the test items and the limited number of sentences and paragraphs presented to each S, no attempt was made to determine possible difficulties in relation to word placement. Inspection of acceptable responses to selected words revealed certain tendencies; for example, the word limpets, placed near the end of the paragraph, was reported read only once in over 90 per cent of the responses. Similarly, for the word philanthropy, the most frequently reported processing "time" was "at the end of first reading." There was also a tendency for Ss to report that word meaning was achieved "during first reading" when the unfamiliar word was near the beginning or middle of the sentence or paragraph, if the

meaning cues were in the environs. Sentence patterns were simple (probably simpler than for the F. W. Tests), making the matter of selection relatively easy for the discerning young reader, it seemed.

Summary

Responses to the U. F. W. Tests - Sentences and Paragraphs revealed that Ss in grade 4, 6, and 8 seemed able to use the linguistic information provided by the context in order to obtain the meaning of an unfamiliar, underlined word in the context. Across the grades the accuracy of word form class of elicited word meaning responses ranged from 83 to 94 per cent of the responses, implying that intuitive knowledge of the grammar appeared to aid Ss in obtaining word meaning which was accurate, at least, in word form class.

That Ss used semantic information was revealed in several ways. First, Ss made use of the meaning cues provided by the context. These cues included not only the five specifically embedded contextual clues (L/E, C/E, D/D, Contrast, Synonym) but also other meaning cues designated by the Ss. Results from the two-way analysis of variance revealed no significant differences across the grades in the number of meaning cues used in sentence items; in paragraph items, the Very Proficient reading groups used significantly more meaning cues than did the Proficient and Less Proficient reading groups. Ss' dependence on single meaning cues to obtain an acceptable meaning for an unfamiliar word tended to vary from 10 to 30 per cent for sentences and from 3 to 23 per cent for paragraphs, across the grades.

For approximately 10 per cent of their responses, Ss made specific reference to personal experience while explaining how word meaning was obtained. It appeared that the more familiar the context, the greater was the tendency to associate personal experience with abstract symbols in verbal context.

Ss' responses revealed also that reasoning made it possible for Ss to use the meaning cues abstracted from the context. Results from the two-way analysis of variance revealed no significant differences in mean reasoning scores for sentences, across the grades. By group, the Very Proficient reading groups were significantly more able to reason unfamiliar word meaning from the context than were the Proficient and Less Proficient reading groups. Furthermore, there tended to be less variability in the reasoning scores of the Proficient reading groups over the Less Proficient reading groups.

From Ss' word meaning responses no significant difference between reading groups (Very Proficient, Proficient, or Less Proficient) or grades (grades 4, 6, or 8) were revealed in ability to control the quality of the language used in the meaning responses to words unfamiliar to each S within each group and each grade. There was a tendency, however, for the Very Proficient reading groups to use more mature, precise word meaning responses than either the Proficient or Less Proficient reading groups used. Distribution of word meaning responses in the four qualitative levels of meaning suggested that proficient and potentially proficient readers in grades 4, 6, and 8 were striving to obtain stability in the task of abstracting the meaning of an unfamiliar word from context.

Ss' reports of how the passages were read to obtain word meaning also revealed that more acceptable word meanings were obtained following one reading of the context than for any of the four remaining processing "times". For paragraphs, there was a tendency, across the grades, to use more processing "time" than was reported for sentences. Since acceptable word meanings were obtained for both sentences and paragraphs after as many as three or more readings of the context, it appeared that the amount of processing (reading) required tended to be an individual matter.

CHAPTER VIII

FINDINGS: COMPARISONS BETWEEN CONTEXT TESTS AND WITH WORD FLUENCY

How Ss obtained a familiar word deleted from the context of sentences and paragraphs was reported in Chapter VI. How Ss obtained the meaning of an unfamiliar word from the context of sentences and paragraphs was described in Chapter VII. The purpose of this chapter is to make comparisons between Ss' scores on the F. W. Tests - Sentences and Paragraphs and their scores on the U. F. W. Tests - Sentences and Paragraphs, as well as to report relationships between Ss' scores on each of these tests and word fluency scores.

Relationships: F. W. Tests and U. F. W. Tests for Sentences and Paragraphs

Comparisons: familiar word scores and unfamiliar word meaning scores

Results from the correlated t tests (Table 8.1) revealed no significant differences between mean scores on the F. W. Tests and the U. F. W. Tests for sentences in grade 4 ($t = 1.50$; $p = .15$), in grade 6 ($t = 0.14$; $p = .89$), and in grade 8 ($t = 1.27$; $p = .22$). That is, when required to obtain the meaning of an unknown word, either an unfamiliar word underlined in the context or a familiar word deleted from the context, Ss seemed to experience similar successes. There was a tendency for grade 4 Ss to achieve somewhat higher scores for the U. F. W. Tests - Sentences ($\overline{X} = 73.33$; S.D. =

12.02) than for the F. W. Tests - Sentences ($\overline{X}$ = 62.57; S.D. = 8.34). Likewise, during the interviews, the younger Ss tended to take considerable time to call to mind a familiar word deleted from the context of some items. It is possible that the demands upon long term memory were considerably higher for the F. W. Tests - Sentences, thereby placing demands upon some Ss who tended not to experience problems in obtaining the meaning of unfamiliar words when the information required was provided by the context.

No significant differences were revealed in Ss' mean scores for paragraphs in grade 4 ($t = -0.14$; $p = .89$), in grade 6 ($t = 1.84$; $p = .08$), and in grade 8 ($t = -1.16$; $p = .26$). Whether the unknown word in a paragraph was familiar or unfamiliar, Ss at each grade level were able to derive appropriate meaning with comparable success.

Because of the difficulties surrounding conversion of unfamiliar words in the vocabulary subtest of the Stanford-Binet Intelligence Test, Form L to adverbs which could be used appropriately in test items of the U. F. W. Tests - Sentences and Paragraphs, they were not included. In spite of this limitation, comparisons of Ss' performance on the two tests, the F. W. Tests - Sentences and Paragraphs and the U. F. W. Tests - Sentences and Paragraphs, were made. Since there was no significant difference in mean word response scores on the F. W. Tests - Sentences and Paragraphs when Ss' responses were grouped according to word form class, it was assumed that this might also be true for mean scores by word form class in the U. F. W. Tests - Sentences and Paragraphs. It is possible, however, that unfamiliar, underlined adverbs might have created significant word meaning problems. Therefore, the results are reported within these limitations mainly to point up the need for future

Table 8.1

Correlated t Tests and Means: F. W. Tests - Sentences and U. F. W. Tests - Sentences by Grade

	F. W. Tests		U. F. W. Tests			
Grade	Mean[a]	S.D.	Mean[a]	S.D.	t	p[b]
4	62.57	8.34	73.33	12.02	-1.50	.15
6	69.79	10.29	70.06	13.79	0.14	.89
8	79.58	8.28	75.56	14.71	-1.27	.22

[a] Converted to percentages
[b] Significant at .05 level

Table 8.2

Correlated t Tests and Means: F. W. Tests - Paragraphs and U. F. W. Tests - Paragraphs by Grade

	F. W. Tests		U. F. W. Tests			
Grade	Mean[a]	S.D.	Mean[a]	S.D.	t	p[b]
4	69.72	12.47	69.17	16.27	-0.14	.89
6	75.56	11.10	80.28	14.58	1.84	.08
8	83.89	8.43	80.83	11.09	-1.16	.26

investigations to overcome some of the problems encountered when unfamiliar words are included in a study.

Comparisons: reasoning F. W. Tests and U. F. W. Tests for sentences and paragraphs

Comparison of reasoning scores by way of correlated t tests revealed no significant differences between the abilities of Ss in grades 6 and 8 to use reasoning to complete the meaning of a sentence with a familiar word missing and an unfamiliar word underlined in the context (Table 8.3). The reasoning demanded by the F. W. Tests seemed to be more difficult for grade 4 Ss. When required to call to mind a precise word of "best fit", not included in the context, grade 4 Ss made more errors in reasoning than did the older Ss in grade 6 and 8 (discussed in the previous chapter). It was shown that grade 4 Ss were able to abstract meaning cues efficiently (that is, in relation to their grade level) and, as shown by their performance on both the F. W. Tests and the U. F. W. Test, they attempted to manipulate the meaning cues efficiently in order to obtain word meaning. The inability to call to mind a precise meaning for a familiar word seemed to inhibit the younger grade 4 Ss in particular, especially if the sentence structure tended to deviate from a simple pattern or, if the Ss' experiential background tended to be limited. In the U. F. W. Tests, however, when required to obtain word meaning of an unfamiliar word, grade 4 Ss were not significantly less able than Ss in grades 6 and 8 were in perceiving and using meaning cues to reason a word meaning which was contained in the context (discussed in Chapter VII). There was also a tendency for the reasoning scores of Ss in grades 6 and 8 to be

Table 8.3

Correlated t Tests and Means: Reasoning F. W. Tests - Sentences and U. F. W. Tests - Sentences by Grade

	F. W. Tests		U. F. W. Tests			
Grade	$\overline{X}^a$	S.D.	$\overline{X}^a$	S.D.	t	p
4	17.08	17.00	46.67	24.04	4.56	.00**
6	31.11	18.38	33.33	26.03	0.33	.75
8	46.25	17.31	49.44	27.18	0.50	.62

[a] Converted to percentages

**Significant at .01 level

somewhat higher when concerned with obtaining the meaning of unfamiliar words in the context as opposed to familiar words missing from the context. This difference seemed to suggest that the reasoning power of Ss across the grades may have been hampered by the task of calling to mind a word deleted from the context because Ss lacked the language power required to complete the task. The discrepancy was statistically significant only at the grade 4 level.

As shown in Table 8.4, no significant differences were found between mean reasoning scores in the F. W. Tests and the U. F. W. Tests for paragraphs in grade 4 (t = 0.99; p = .34), in grade 6 (t = 0.66; p = .52), and in grade 8 (t = -0.85; p = .41). While grade 4 Ss tended to have less difficulty reasoning to obtain a familiar word deleted from the context of paragraphs ($\overline{X}$ = 30.28; S.D. = 22.08) than from sentences ($\overline{X}$ = 17.08; S.D. = 17.00), their mean reasoning scores for unfamiliar words in paragraphs was somewhat higher ($\overline{X}$ = 37.78; S.D. = 27.60). Again, these results seemed to imply that recalling a word, even though a familiar word, placed constraints upon the younger grade 4 Ss.

The mean reasoning scores of grade 6 Ss tended to be higher for unfamiliar words than for familiar words in paragraphs but the differences were slight. It is possible that grade 8 reasoning scores failed to reveal a similar tendency because one S in the Less Proficient grade 8 reading group tended to give up as the result of apparent confusion when faced with the larger context of a paragraph and even more so, when unfamiliar words were part of the task.

Table 8.4

Correlated t Tests and Means: Reasoning F. W. Tests - Paragraphs and U. F. W. Tests - Paragraphs by Grade

	F. W. Tests		U. F. W. Tests			
Grade	$\overline{X}^a$	S.D.	$\overline{X}^a$	S.D.	t	p[b]
4	30.28	22.08	37.78	27.60	.99	.34
6	47.50	21.30	50.56	30.09	.66	.52
8	57.22	19.67	52.22	23.23	-0.85	.41

[a] Converted to percentages
[b] Significant at .05 level

Since the U. F. W. Tests were given during the second half of the second interview, the possibility of practice effects confounding the results was considered. In addition, paragraph items were presented to all Ss after sentence items because the level of difficulty for unfamiliar words in paragraphs was, on the average, greater than the level of difficulty for sentence items. Considering the level of difficulty of all the unfamiliar words, Ss appeared not to have been inhibited in "thinking power" by the presence of unfamiliar words. Differences in the given tasks were obvious, however, even though the differences in Ss' mean scores on the F. W. Tests and the U. F. W. Tests were not statistically significant.

Relationships: F. W. Tests and U. F. W. Tests for sentences and paragraphs

In Chapter VI significant moderate relationships were reported between mean scores of the F. W. Tests - Sentences and the criterion comprehension scores (C.T.B.S.); for grade 4 (r = .65), for grade 6 (r = .70), and for grade 8 (r = .80). The amount of common variance, likely attributable to a common source, was approximately 42 per cent at grade 4 level, 49 per cent at grade 6 level, and 64 per cent at grade 8 level. To that extent, then, the F. W. Tests - Sentences and the reading comprehension test (C.T.B.S.) appeared to be measuring the same reading abilities.

Likewise, significant moderate coefficients of correlation were found between the F. W. Tests - Paragraphs and the reading comprehension test (C.T.B.S.) for grades 4 and 8 (each r = .70), revealing that approximately one half of the variance was common to both tests and indicating, to that extent, the tests were probably measuring the same reading abilities. A positive (but not significant) relationship (r = .43) at the grade 6 level, indicated that the two tests tended to be measuring the same reading abilities to a limited extent (common variance approximately 19 per cent).

By contrast, relationships between mean scores on the U. F. W. Test - Sentences and the reading comprehension test (C.T.B.S.) were low with coefficients of correlation for grade 4 (r = .01) and for grade 6 (r = .12), as shown in Table 8.5. The amount of common variance was less than 2 per cent, indicating that the two tests were not measuring the same reading abilities. At the grade 8 level, however, a significant moderate relationship (r = .57) was found.

For paragraphs, significant moderate relationships were found at the grade 4 level (r = .58) and at the grade 8 level (r = .69) between the criterion comprehension scores and U.F.W. Test. It is probable that the two tests were measuring the same skills to the amount of common variance, approximately 34 per cent at the grade 4 level and 48 per cent at grade 8 level. A low positive (but not significant) relationship was found for grade 6 (r = .32), similar to that found between the F. W. Tests - Paragraphs and the criterion reading comprehension test (C.T.B.S.).

Coefficients of correlation between scores on the F. W. Tests and the U. F. W. Tests for sentences revealed no significant relationship between the two tests across the grades (Table 8.6). For paragraphs, low positive correlations were found between the

Table 8.5

Coefficients of Correlation U. F. W. Tests - Sentences and Paragraphs and Reading Comprehension Scores

Variable	Reading Comprehension Scores (C.T.B.S.) Grade 4	Grade 6	Grade 8
U. F. W. Test - Sentences	.01	.12	.57*
U. F. W. Test - Paragraphs	.58*	.32	.69**

*Significant at .05 level
**Significant at .01 level

Table 8.6

Coefficients of Correlation U. F. W. Tests and F. W. Tests for Sentences and Paragraphs

Variable	F. W. Tests Sentences 4	6	8	Paragraphs 4	6	8
U. F. W. Test - Sentences	.06	.30	.47	.04	.29	.47*
U. F. W. Test - Paragraphs	.47*	.44	.59**	.38	.69**	.40

*Significant at .05 level
**Significant at .01 level

scores on the F. W. Tests and the U. F. W. Tests for grade 4 (r = .38) and for grade 8 (r = .40). Although the mean scores of grade 4 Ss were almost identical on the two tests, individual scores on one test were not appropriate for predicting individual scores on the other test.

Bv contrast, the difference between mean scores on the F. W. Tests and the U. F. W. Test for paragraphs was approaching significance at the grade 6 level. A significant coefficient of correlation (r = .69) suggested that the two tests were probably measuring the same reading skills to the amount of the common variance, approximately 47 per cent.

Therefore, although Ss tended to use syntactic and semantic information with considerable skill in both tasks (F. W. Tests and U. F. W. Tests), it appeared that the reading-thinking skills required by each task were, in some respects different. What was unique about each task was not determined by this study. Results from the F. W. Tests - Sentences and Paragraphs suggested that Ss who obtained an acceptable word response tended to use the meaning cues abstracted from the context. It appeared that Ss used the meaning cues by determining their relationship to each other and to the context as a whole, for the purpose of helping them call to mind a familiar word missing from the context. Ss most successful in completing the tasks provided by the U. F. W. Tests - Sentences and Paragraphs seemed also to abstract meaning cues from the context for the purpose of determining their relationship to each other, to the context as a whole, and in particular, to the underlined unfamiliar word in that context. Although the reasoning power demanded by each task seemed to vary, within each test and between tests, Ss across the grades tended to approach the task of obtaining word meaning from context in ways which were similar.

Word Fluency

As shown in Table 8.7, relationships between word fluency and ability to obtain the meaning of a familiar word deleted from the context (F. W. Tests - Sentences and Paragraphs) tended to vary by grade. In grade 4, there was a low negative coefficient of correlation between word fluency scores with no structural limitations for sentences (r = -.007) and for paragraphs (r = -.011). Examination of Ss' protocols revealed that two Ss in the Less Proficient reading group and one S in the Very Proficient reading group, for example, had high word fluency scores but tended to have lower word response scores than some Ss in their respective groups. The low positive relationship between total word fluency scores (structural and no structural limitations) for sentences (r = .202) and for paragraphs (r = .153) revealed a low positive relationship between word fluency structural limitations (e.g. rhyming words or four-legged things) and ability to complete the meaning of the context. The word fluency test with structural limitations, like the task of completing the context with a word representing an intended meaning, tended to require convergent thinking while the word fluency test with no structural limitations tended to allow for greater divergency in the flow of ideas (words).

Table 8.7

Coefficients of Correlation: Word Fluency and F. W. Tests - Sentences and Paragraphs; Word Fluency and U. F. W. Tests - Sentences and Paragraphs

Variable	Word Fluency					
	Grade 4		Grade 6		Grade 8	
	Test 1[a]	Total[b]	Test 1[a]	Total[b]	Test 1[a]	Total[b]
F. W. Tests - Sentences	-.007	.202	.262	.451	.369	.398
F. W. Tests - Paragraphs	-.011	.153	.331	.201	.329	.380
U. F. W. Tests - Sentences	-.031	-.038	.001	.316	.467*	.493*
U. F. W. Tests - Paragraphs	.023	.051	.019	.160	.494*	.546*

[a] No structural limitations
[b] Structural and no structural limitations
*Significant at .05 level

In grades 6 and 8 there was a tendency, however, for the relationship between word fluency and word responses to the *F. W. Tests - Sentences and Paragraphs* to be positive and somewhat higher than was determined for grade 4. Since the older Ss tended to experience fewer problems in recalling familiar words deleted from the context than was experienced by grade 4 Ss, the higher coefficients of correlation for grade 6 (r = .451, for sentences; r = .201, for paragraphs) and for grade 8 (r = .398, for sentences; r = .380, for paragraphs) were realistic. It appeared that Ss in grades 6 and 8 were somewhat better equipped either to allow ideas to flow or to control them when required, although the relationship was not statistically significant.

The relationship between word fluency and word meaning responses (*U.F.W. Tests - Sentences and Paragraphs*) revealed similar tendencies to that reported for relationships between word fluency and word responses (*F. W. Tests - Sentences and Paragraphs*). In grade 4 there were low negative coefficients of correlation between word fluency and sentences when there were no structural limitations (r = .031) and when there were structural limitations (r = .038). For paragraphs, low positive correlation coefficients were revealed (r = .023 and r = .051). In grade 6, low positive correlation coefficients, ranging from r = .001 to r = .316, were revealed. In grade 8, however, moderate significant coefficients of correlation were revealed between sentence word meaning responses and word fluency both without structural limitations (r = .467) and with structural limitations (r = .493). Similarly, moderate positive relationships were revealed between word meaning responses to paragraphs and word fluency without structural limitations (r = .494) and with structural limitations (r = .546). These findings seemed to suggest that the language power of the older grade 8 Ss made it possible for them to allow ideas and words to flow as required by the task, whether in isolation (i.e. word fluency tests) or in the context of sentences or paragraphs containing unfamiliar words for which they were seeking meaning.

Summary

Comparison of Ss' performance on the F. W. Tests - Sentences and Paragraphs and the U. F. W. Tests - Sentences and Paragraphs revealed the following patterns of similarities and differences in each grade:

1. There were no significant differences in Ss' ability to obtain the meaning of an unfamiliar word in the context and their ability to call to mind the meaning of a familiar word missing from the context of sentences and paragraphs.

2. There was no significant difference in the reasoning used by Ss in grades 6 and 8 to obtain the meaning of unfamiliar words in the context or familiar words missing from the context. Grade 4 Ss, however, seemed to have a significantly greater number of problems reasoning a familiar word which was not in the context but supposedly, in the mind of the reader. For paragraphs, there was no significant difference across the grades, in Ss' ability to obtain word meaning from context, whether the word was familiar and missing

from the context or unfamiliar and included in the context. With the information more diffusely distributed in paragraphs than in sentences, Ss across the grades tended to use the meaning cues, analyze and integrate them more efficiently.

It appeared that, in general, Ss in grades 4, 6, and 8 were able to abstract the meaning from the context, seek relationships between the parts abstracted, and thereby make judgments concerning how best to complete the meaning of the context of the F. W. Tests - Sentences and Paragraphs and the U. F. W. Tests - Sentences and Paragraphs.

Relationships between word fluency and ability to obtain word meaning from the context of both the F. W. Tests - Sentences and Paragraphs and the U. F. W. Tests - Sentences and Paragraphs were significant only at the grade 8 level for unfamiliar words, suggesting that superior language power made it possible for older grade 8 Ss to control the flow of words or ideas, whether in isolation or in the context of sentences and paragraphs requiring completion of meaning, with greater skill than was demonstrated by grades 4 and 6.

CHAPTER IX

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The importance of meaning vocabulary as a prerequisite to reading comprehension is, in general, accepted by those responsible for reading instruction. Moreover, it has long been assumed that use of context provides the reader with a valuable way to derive the meaning of an unknown word even though research to support this point of view tended to be inconclusive. Although reported research seems to suggest that younger readers are less successful in using the context to obtain word meaning than are older readers, there is little research to determine why younger readers may be less efficient in using context as an aid to word meaning. As a result of research, some information has been obtained concerning how mature readers derive meaning from context. Little is known about the process used by maturing readers to obtain word meaning from context. Hence, an exploratory study was designed to investigate how maturing readers obtained word meaning from context.

This chapter provides a summary of the study and, on the basis of the findings, presents the main conclusions drawn, followed by their educational implications. Suggestions for further research conclude the chapter and the study.

Summary of the Study

The purpose of the study was to investigate how maturing readers obtained the meaning of an unknown word from context. An unknown word was defined in two ways: it might be (1) a familiar word deleted from the context and replaced by a blank space or a nonsense word (both of equal length), or (2) an unfamiliar word underlined in the context. These unknown words, placed in the contexts of sentences and paragraphs, were compiled as two reading tests -- the *Familiar Words Tests - Sentences and Paragraphs* and the *Unfamiliar Words Tests - Sentences and Paragraphs*. Each test item was presented individually to each subject, untimed and as informally as possible. Responses to the two tests were tape recorded and later transcribed to typewritten protocols. The possibility of a relationship between word fluency and ability to obtain word meaning from context was investigated by a battery of word fluency tests was presented to each subject in a manner similar to that outlined for the other tests.

The fifty-four subjects, representing very proficient, proficient, and less proficient readers in grades 4, 6, and 8 from eight elementary public schools in Saskatoon, Saskatchewan, were selected on the basis of their performance on a standardized reading test (vocabulary and comprehension). At each grade level, eighteen subjects formed three reading groups -- the Very Proficient, Proficient and Less Proficient reading groups.

No 'a priori' plans for analyzing Ss' responses were made. Instead, criteria for classification of responses we[illegible] developed from the Ss' responses. These criteria were based upo[illegible]e of linguistic information in combination with an intel[illegible] approach to the task of obtaining word meaning from context. The reliability of the post hoc classification schemes, relative to use of meaning cues, to reasoning, and to the quality of language control as determined by the word or word meaning elicited, was determined independently by four judges.

Since both the reading process (how word meaning was obtained) and the product (word meaning) were examined in the study, findings were reported in terms of qualitative descriptions, supplemented wherever possible by quantifying measures submitted to statistical treatment to determine their significance.

Findings and Conclusions of the Study

On the basis of Ss' explanations of how the sentences and paragraphs were read to obtain the familiar word deleted from the context or the unfamiliar word underlined in the context, some aspects of the reading process were identified. These were summarized in relation to the research questions posited and to the null hypotheses tested. The report of the findings and the conclusions of the investigation which follows includes, therefore, brief responses to each research question and to each hypothesis tested.

Summary of findings and conclusions: research question 1

Research question 1

> How do Very Proficient, Proficient, and Less Proficient reading groups in grades 4, 6, and 8 obtain a familiar word deleted from the context of sentences and paragraphs?

Hypothesis 1.10: for sentences

There is no significant main effect due to group or grade on

1.11 the number of meaning cues used to obtain a familiar word deleted from the context;

1.12 the reasoning used to obtain a familiar word deleted from the context.

1.13 the quality of the word elicited to represent a familiar word deleted from the context.

Hypothesis 1.20: for paragraphs

There is no significant main effect due to group or grade on

1.21 the number of meaning cues used to obtain a familiar word deleted from the context;

1.22 the reasoning used to obtain a familiar word deleted from the context;

1.23 the quality of the word elicited to represent a familiar word deleted from the context.

Summary

Although Ss tended to vary in their approach to the task of obtaining the word deleted from the context of sentences and paragraphs, patterns of reading behavior were revealed which made possible the following general description of processing the context to derive word meaning. Either during or after reading each sentence or paragraph test item from which a familiar word was deleted, Ss abstracted one or more meaning cues from the context. Each meaning cue -- single words, phrases, or clauses -- appeared to be selected by the S and analyzed in relation to previous background knowledge and experience represented by the abstracted segment, to other meaning cues in the context, and to a word called to mind for the purpose of using it further in a particular context. From the minimal cues required for the task, ideas were derived and synthesized by way of reasoning, making it possible for proficient maturing readers to elicit a precise, mature word in keeping with their level of understanding of the context.

Young maturing readers tended to exhibit a variety of testing techniques in order to obtain an appropriate word missing from the context. If the Ss were not able to immediately call to mind a word or if they were dissatisfied with the word first chosen, testing of possible relationships seemed to continue until a word of "best fit" could be accommodated into the particular context. That is, the extent of reading required to obtain a familiar word deleted from the context of sentences and paragraphs varied from very limited processing "time" (i.e. "during first reading") to extensive processing "time" (i.e. "three or more readings"). Across the grades the most popular and most successful reported processing "time" was when the word was obtained at the "end of first reading." There was a tendency for grade 8 Ss to require less extensive reading compared to more extensive reading for Ss in grades 4 and 6 for paragraphs over sentences. These findings seemed to suggest that the older Ss, being more efficient in abstracting meaning cues from context than were the younger Ss, were aided rather than abetted by the larger, less compacted context of the paragraph.

Grade 4 Ss reported rereading to check meaning by making certain that the elicited word "fit" the context of sentences and paragraphs more frequently than did Ss in grades 6 and 8. In view of the increasing efficiency by grade revealed in abstracting essential meaning cues from the context and integrating them by reasoning to obtain a mature, precise word of "best fit" for the context, it appeared that confidence in reading for word meaning from context increased also by grade.

The level of efficient language-thinking power demonstrated by the Very Proficient, Proficient, and Less Proficient reading groups in grades 4, 6, and 8 tended to vary. Significant differences were revealed by: (1) the number of meaning cues abstracted; (2) the reasoning used; and (3) the quality of the word elicited to represent the familiar word deleted from the context of sentences and paragraphs.

(1) Number of meaning cues used. Grade 6 Ss used significantly more meaning cues to complete the context of sentences than did grade 4 Ss and slightly more than did grade 8 Ss. It appeared that grade 6 Ss, having arrived at the stage of being able to separate discrete meaning cues in the context, abstracted them freely. By contrast, the older grade 8 Ss tended to be more selective while the younger grade 4 Ss continued to work diligently to abstract from the context as many discrete, meaningful cues as were possible.

Very Proficient reading groups were significantly more able to abstract meaning cues from the context than were the Less Proficient reading groups. Although Proficient reading groups tended to use fewer meaning cues than did the Very

Proficient reading groups, they tended to use more meaning cues than did the Less Proficient reading groups. Therefore, since the differences in number of meaning cues used by grade and by group were significant, the null hypothesis 1.11 was rejected.

To obtain a familiar word deleted from a paragraph, grade 6 Ss tended to use more meaning cues than were used by grade 4 Ss but fewer meaning cues than were used by grade 8 Ss. Since the younger Ss were not significantly less able to abstract meaning cues from a paragraph than were the older Ss, hypothesis 1.21 was upheld in relation to main effects due to grade.

By group, however, the Very Proficient reading groups used a significantly greater number of meaning cues to obtain a familiar word deleted from a paragraph than did the Less Proficient reading groups, resulting in a rejection of hypothesis 1.21 relative to use of meaning cues by groups. There was a tendency for the Proficient reading groups to use fewer meaning cues than were used by the Very Proficient reading groups and to use more meaning cues than were used by the Less Proficient reading groups, suggesting that the number of meaning cues reportedly used seemed to have considerable bearing on the maturing reader's success in obtaining the familiar word deleted from the context of paragraphs.

The average number of meaning cues reported used by the Ss ranged from slightly less than half to slightly more than half the reported available meaning cues. However, from 3 to 7 per cent of the acceptable word responses were based on reported use of single meaning cues. Responses to all five sentence-types (L/E, C/E, D/E, Contrast, Synonym) were represented in this count. Moreover, different single meaning cues tended to be used for any one sentence or paragraph, suggesting that key meaning cues seem to vary according to individual needs.

Lastly, meaning cues, classified as embedded (in relation to the five types of contextual clues specifically embedded in the context) and other (reported by Ss but not specifically embedded in the context), were reportedly used. For the majority of responses, Ss tended to use both types of meaning cues. For some responses, however, either embedded or other meaning cues were used exclusively.

(2) Use of reasoning. Ability to reason effectively in order to obtain the familiar word deleted from the context of sentences increased significantly by grade. Across the grades the Very Proficient reading groups achieved significantly higher mean reasoning scores than did the Proficient and the Less Proficient reading groups. Therefore, the null hypothesis 1.12 was rejected.

Proficient reading groups tended to abstract meaning cues in numbers not significantly different from the Very Proficient reading groups. When required to use the meaning cues by way of reasoning, however, the proficient reading groups were less able than were the Very Proficient reading groups. The mean reasoning scores of the Proficient reading groups were higher, but not significantly higher, than those of the Less Proficient reading groups.

Successful use of reasoning to obtain a familiar word deleted from the context of a paragraph also increased significantly by grade. It appeared that grade 4 Ss were able to abstract meaning cues from paragraphs in numbers not significantly lower than those of Ss in grades 6 and 8. In using the meaning cues by way of reasoning, however, the efforts of the younger grade 4 Ss were less effective.

Findings with respect to use of reasoning in paragraphs were similar by groups to that reported for sentences. Very Proficient reading groups reasoned with significantly superior efficiency over the Proficient and Less Proficient reading groups. Hence, hypothesis 2.22 was not supported by group or by grade. Differences in reasoning ability between Proficient and Less Proficient reading groups were not significant.

(3) Quality of the word elicited. The quality of the familiar word elicited to represent the word deleted from the context of sentences differed significantly by group and by grade, resulting in a rejection of hypothesis 1.13. There was a significant progression in Ss' ability to select a mature, precise word to complete the context of a sentence. Within each grade the Very Proficient reading groups made significantly superior word choices over the Proficient and Less Proficient reading groups. These findings seemed to suggest that the older grade 8 Ss and the Very Proficient reading groups within each grade were in greater control of the language as shown by their choice of more precise, mature words to complete the context.

Although the Proficient reading groups tended to elicit a meaningful word to complete the context more frequently than did the Less Proficient reading groups, considerable variability within each group prevailed.

The quality of the familiar word elicited by grade 8 Ss to complete the context of a paragraph was significantly superior to that revealed by Ss in grades 4 and 6. However, given the support of what appeared to be more obvious information in a paragraph compared to a sentence, the quality of control over language (i.e. the elicited word), demonstrated by grade 4 Ss in completing the context was only slightly lower than that of the grade 6 Ss.

The ability of the Very Proficient reading groups to control the quality of the word elicited to complete the context of a paragraph was significantly superior to that revealed by the Proficient and Less Proficient reading groups. Hypothesis 1.23 was therefore rejected by group as well as by grade. Although the Less Proficient reading groups were somewhat less able to control the quality of the word elicited to complete the context of a paragraph as effectively as did the Proficient reading group, differences were not significant.

It was therefore concluded that proficient maturing readers in the study seemed to reason the word deleted from the context of sentences and paragraphs by combining their linguistic knowledge and thinking power. Successful processing of the context appeared to be related to the Ss' ability to abstract, select, analyze, and integrate the meaning cues in order that the word called to mind represented a precise, mature word which could be accommodated into the given context of sentences and paragraphs.

Summary of findings and conclusions: research question 2

Research question 2

How do Very Proficient, Proficient, and Less Proficient reading groups in grades 4, 6, and 8 obtain the meaning of an unfamiliar word underlined in the context of sentences and paragraphs?

Hypothesis 2.10; for sentences

There is no significant main effect due to group or grade on

2.11 the number of meaning cues used to obtain the meaning of an unfamiliar word underlined in the context;

2.12 the reasoning used to obtain the meaning of an unfamiliar word underlined in the context;

2.13 the quality of the meaning elicited for an unfamiliar word underlined in the context.

Hypothesis 2.20; for paragraphs

There is no significant main effect due to group or grade on

2.21 the number of meaning cues used to obtain the meaning of an unfamiliar word underlined in the context;

2.22 the reasoning used to obtain the meaning of an unfamiliar word underlined in the context;

2.23 the quality of the meaning elicited for an unfamiliar word underlined in the context.

Summary

Ss approached the task of deriving the meaning of an unfamiliar word underlined in the context in ways similar to that revealed for the task of obtaining a familiar word deleted from the context. While reading the passage or following an overview of it, Ss reported abstracting the minimal meaning cues required -- single words, phrases, or clauses. These cues were analyzed in terms of their relationship to previous background knowledge and experience, to other meaning cues in the context, and to the underlined unfamiliar word in the context. Proficient maturing readers across the grades seemed to integrate or synthesize the ideas obtained from the analysis, thereby deducing the meaning of the unfamiliar word.

Testing techniques used by the Ss attempting to obtain word meaning were also reported. Ss not able to obtain an appropriate word meaning while processing the context the first time, reported rereading the passage until they were successful. Reported processing "times" ranged from "end of first reading" to "three or more readings." The largest proportion of acceptable word meanings were reported for "end of first reading" processing "times."

Although grade 8 Ss seemed to require less processing "time" than did Ss in grades 4 and 6, there was a tendency for Ss to use all five reported processing "times", depending on the ease or difficulty with which word meaning was obtained. Likewise, Very Proficient reading groups tended to report less processing "time" for obtaining acceptable word meanings than did the Proficient and Less Proficient reading groups.

Rereading to check word meaning was also reported. Younger Ss tended to reread for this purpose not only more frequently but also more painstakingly than did the older grade 8 Ss. Older Ss seemed to skim or to read only essential segments of the context as opposed to rereading the entire context.

Differences were revealed by group and by grade in: (1) the number of meaning cues reported; (2) the reasoning used; and (3) the quality of the word meanings obtained.

(1) Number of meaning cues used. Although the number of meaning cues elicited tended to increase by grade, there was no significant difference in the number of meaning cues reported for sentences by grade or by group. It appeared that grade 4 Ss were as efficient as older Ss in grades 6 and 8 in abstracting the meaning cues (embedded or other) required to obtain the meaning of an unfamiliar word underlined in the sentence. By group there was considerable variability, suggesting that individuals within each group differed somewhat in their ability to abstract meaning cues essential to the task of getting word meaning. However, differences were not significant; the null hypothesis 2.11 was therefore upheld.

For paragraphs, grade 6 Ss tended to use more meaning cues (embedded or other) than did either grades 4 or 8, again suggesting that at the grade 6 level, Ss in a stage of transition, abstracted the meaning cues freely but remained less able to use them to obtain word meaning as efficiently as did the older grade 8 Ss. There were, however, significant differences in use of meaning cues by group, making necessary rejection of the null hypothesis 2.21. The Very Proficient reading groups used significantly more meaning cues than the Less Proficient reading groups used: the Proficient reading groups used more meaning cues than the Less Proficient reading groups used. Individuals within the three groups tended to vary considerably in their ability to abstract meaning cues for unfamiliar words of increasing difficulty in paragraphs.

(2) Use of reasoning. When required to reason the meaning of an unfamiliar word underlined in the context of a sentence (i.e. use the meaning cues to solve the meaning problem of the unfamiliar word), grade 4 Ss were as capable of obtaining word meaning as were Ss in grades 6 and 8. Therefore, since the differences by groups were not significant, the null hypothesis 2.12 was upheld. Across the grades the Very Proficient reading groups tended to reason efficiently; that is, they were consistently more efficient compared to the Proficient and Less Proficient reading groups who seemed to be somewhat less stable in their efforts to reason, even when the unfamiliar words were, in fact, individually unfamiliar.

With respect to reasoning the meaning of an unfamiliar word underlined in a paragraph, the success of grade 4 Ss was comparable to that of Ss in grades 6 and 8. It appeared that the grade 4 Ss, given words which were unfamiliar on an individual basis, were able to reason as efficiently as did the older Ss in grades 6 and 8.

Although the Proficient reading groups tended to be somewhat less efficient in reasoning than were the Very Proficient reading groups, they tended also to be somewhat more efficient in reasoning than were the Less Proficient reading groups. The Very Proficient reading groups were significantly more successful in reasoning than were the Less Proficient reading groups. Therefore, the null hypothesis 2.22 was rejected by group but upheld by grade.

(3) Quality of word meaning. Given the task of obtaining the meaning of an unfamiliar word, of which the difficulty level was

specific to the individual (as determined by a pretest), Ss in the study, whether in grades 4, 6, or 8, were able to provide an appropriate meaning for the word in the context of a sentence with comparable skill. By group, however, differences in the quality of the elicited meanings were revealed. The Very Proficient reading groups were significantly more successful in providing a precise, mature explanation of the meaning of an unfamiliar word than were the Less Proficient reading groups: their explanations of word meanings were somewhat superior to those of the Proficient reading groups. Variability within each of the Proficient and Less Proficient reading groups was apparent but the differences between groups in ability to obtain the meaning of an unfamiliar word underlined in the context of a sentence were not significant. However, since a significant difference in the quality of word meaning was revealed by group, the null hypothesis 2.13 was rejected by group: it was upheld by grade.

Although word meaning scores were not significantly different, they tended to increase by grade. Therefore, the null hypothesis 2.23 was upheld by grade. By group, however, significant differences were revealed in that the Less Proficient reading groups were significantly less able to elicit word meanings comparable to those of the Very Proficient reading groups, resulting in rejection of the null hypothesis 2.23 by group. The Proficient reading groups tended to obtain appropriate word meanings with increased success over the Less Proficient reading groups but with less success than did the Very Proficient reading groups.

It was concluded that proficient maturing readers in the study tended to reason the meaning of the unfamiliar word by combining linguistic knowledge and thinking power. It appeared that word meaning was obtained by careful selection of meaning cues which were analyzed by way of relating them to background knowledge and experience, to other meaning cues in the context, and to the unfamiliar word underlined in the context. By integrating or synthesizing the related segments, Ss were able to obtain the meaning of the unfamiliar word in sentences and paragraphs.

Summary of findings and conclusions: research question 3

Research question 3

> Is there a difference across the grades in the Ss' ability to obtain a familiar word deleted from the context of sentences and paragraphs in relation to
>
> (a) its word form class?
>
> (b) each of the five selected types of contextual clues (Language experience, Cause and effect, Direct description, Contrast, Synonym) of which at least one is embedded in the context?

Hypothesis 3.0

> There is no significant difference across the grades in the Ss' ability to obtain a familiar word deleted from the context of sentences and paragraphs in relation to
>
> 3.1 its word form class;
>
> 3.2 each of the five selected types of contextual clues (Language experience, Cause and effect, Direct Description, Contrast, Synonym) of which at least one is embedded in each context.

Summary

Differences in word responses by grammatical class were not significant. Ss' mean word response scores represented by nouns, verbs, and adjectives differed slightly. Across the grades word response scores representing adverbs tended to be lower than word response scores representing nouns, verbs, and adjectives but differences were not statistically significant. These findings seemed to suggest factors other than word form class contributed to problems encountered by Ss while processing the context to obtain a familiar word deleted from it. The null hypothesis 3.1 was upheld.

Significant differences were revealed by group and by grade in relation to type of embedded contextual clue, resulting in rejection of the null hypothesis 3.2. The quality of the familiar word obtained by the Very Proficient reading groups was significantly superior over that of the Less Proficient reading groups for all five sentence types (L/E, C/E, D/D, Contrast, Synonym). The words elicited by the Very Proficient reading groups were significantly superior over those of the Proficient reading groups for three sentence types, Synonym, D/D, and Contrast. By contrast, familiar words elicited to complete the context of sentences by the Proficient reading groups were significantly superior to those of the Less Proficient reading groups for L/E and C/E sentence types.

Whether or not a particular type of contextual clue embedded in the context aided or abetted the process of obtaining the word deleted from the context was not revealed. Responses of some Ss suggested that function words such as until, in, but, around, with helped some Ss obtain word meaning while other Ss tended to ignore them. Furthermore, sentence structure seemed to inhibit some Ss; for example, the expression "partially done and scattered around his room" (Sentence 3N) seemed to create problems which may have influenced Ss' responses to the Contrast-type sentence items.

Significant differences were revealed across the grades for all five sentence types. However, whether the differences were caused by the embedded clue(s) or by other factors in the context were not determined. The quality of the familiar word elicited by grade 8 Ss was significantly superior to that of the grade 4 Ss for all five sentence types and to that of grade 6 Ss for two types, D/D and Contrast. Differences between grades 4 and 6 were significant for one type only, C/E.

Of the five types of embedded contextual clues, Ss across the grades were significantly the most successful in obtaining a familiar word deleted from the language experience (L/E) type sentence. It was not determined whether results were related to sentence type or to sentence structure or to other unidentified factors. No consistent hierarchy of ease was determined across the grades by Ss' responses to the four remaining types of contextual clues embedded in sentence and paragraph items.

Summary of findings and conclusions: research question 4

Research question 4

Is there a difference within a grade in the Ss' ability to obtain a familiar word deleted from the context of a sentence compared to a paragraph?

Hypothesis 4.0

There is no significant difference within a grade in the Ss' ability to

4.1 reason the familiar word deleted from the context of a sentence and a paragraph;

4.2 obtain the familiar word deleted from the context of a sentence and a paragraph.

Summary

Within each grade Ss were able to reason and obtain a familiar word deleted from the context of a paragraph over a sentence with significantly superior skill. Hence, the null hypotheses 4.1 and 4.2 were rejected.

While the reason for Ss' greater success in using the meaning cues by way of reasoning to aid in obtaining a familiar word deleted from the context was not determined, the findings suggest that the extended context and/or the less complex sentence structures of the paragraphs over the sentences may have contributed to the significant differences revealed.

Summary of findings and conclusions: research question 5

Research question 5

Is there a difference within a grade in the Ss' ability to obtain an unfamiliar word underlined in the context of a sentence compared to a paragraph?

Hypothesis 5.0

There is no significant difference within a grade in the Ss' ability to

5.1 reason the unfamiliar word underlined in the context of a sentence and a paragraph;

5.2 obtain the unfamiliar word underlined in the context of a sentence and a paragraph.

Summary

In grades 4 and 8 the Ss were able to reason and obtain the meaning of the unfamiliar word in a sentence and a paragraph with comparable skill. In grade 6, however, significantly greater success resulted from reasoning to obtain an unfamiliar word underlined in a paragraph than in a sentence. There was a tendency for the Less Proficient reading group to experience considerable difficulty in using the context of the sentence to determine the meaning of the unfamiliar word. When the unfamiliar word was presented in a paragraph, Ss in all groups tended to be more confident in obtaining word meaning. Moreover, throughout the study, grade 6 Ss tended to be less consistent in their efforts than were Ss in grades 4 and 8. It is possible that the significantly lower intelligence scores of grade 6 Ss (reported in Chapter III) compared to Ss in grades 4 and 8 was reflected in their ability to obtain word meaning from context.

The null hypotheses 5.1 and 5.2 were, therefore, upheld for grades 4 and 8 but rejected for grade 6.

Summary of findings and conclusions: research question 6

Research question 6

Is there a difference within a grade in the Ss' ability to obtain the familiar word deleted from the context of a

> sentence and a paragraph, depending on whether the missing word is represented by a nonsense word or a blank space?

Hypothesis 6.0

> There is no significant difference within a grade in the Ss' ability to obtain a familiar word represented by a nonsense word or a blank space
>
> 6.1 in the context of a sentence;
>
> 6.2 in the context of a paragraph.

Summary

There was no significant difference within grades in Ss' success in obtaining a familiar word, represented by a nonsense word or a blank space, in sentences and paragraphs. There was a tendency, however, for the Less Proficient reading groups to experience somewhat greater difficulty with test items having nonsense words instead of blank spaces. It is possible that the less proficient reader unconsciously attempted to use the letters in the nonsense words as meaning cues, although such a practice was not reported.

The null hypotheses 6.1 and 6.2 were upheld.

Summary of findings and conclusions: research question 7

Research question 7

> Is there a difference in the way the Ss within a grade obtained a familiar word deleted from the context and the meaning of an unfamiliar word underlined in the context of a sentence and of a paragraph?

Hypothesis 7.10: for sentences

> There is no significant difference within a grade in the Ss' ability to obtain a familiar word deleted from the context and the meaning of an unfamiliar word underlined in the

context as revealed by

7.11 the reasoning used;

7.12 the quality of the familiar word and the quality of the meaning of the unfamiliar word elicited.

Hypothesis 7.20: for paragraphs

There is no significant difference within a grade in the Ss' ability to obtain a familiar word deleted from the context and the meaning of an unfamiliar word underlined in the context as revealed by

7.21 the reasoning used;

7.22 the quality of the familiar word and the quality of the meaning of an unfamiliar word elicited.

Summary

For Ss in grades 6 and 8 there was no significant difference in ability to reason the word deleted from the context and the meaning of the unfamiliar word underlined in the context of a sentence. Grade 4 Ss, however, were significantly more successful in reasoning to obtain an unfamiliar word underlined in the context than to reason and obtain an appropriate word deleted from the context. It seemed probable that the reasoning of the younger Ss tended to be limited by the task of calling to mind a word of "best fit" to represent the familiar word missing from the context. Hence, the null hypotheses 7.11 and 7.12 were upheld for grades 6 and 8 but rejected for grade 4.

It appeared that the Ss, learning how to process the context efficiently for the purpose of obtaining word meaning from it, were able to do so with considerable skill, whether the unknown word was a familiar word deleted from the context or an unfamiliar word underlined in the context. However, the question was raised, while observing the Ss discuss their responses to the U. F. W. Tests - Sentences and Paragraphs, as to how much meaning was actually obtained for the unfamiliar word. In order to call to mind a precise, mature familiar word, Ss appeared to make use of previously well-established concepts, as revealed by their explanations. By contrast, since the meaning of the unfamiliar word was not previously known, it is wondered whether sufficient depth of meaning was obtained during this one encounter with the word to make future recall of meaning possible and if so, how much meaning.

There was no significant difference within grades in the Ss' ability to reason and obtain either a familiar word deleted from the context of the meaning of the underlined unfamiliar word in the context of a paragraph. Therefore, the null hypotheses 7.21 and 7.22 were upheld.

It is possible that grade 4 Ss, given the larger context of a paragraph instead of a sentence, were able to gain sufficient confidence which enabled them to process the context of paragraphs efficiently, irrespective of the nature of the unknown word.

Summary of findings and conclusions: research question 8

Research question 8

> What is the relationship within a grade between the Ss' ability to obtain an unknown word, either a familiar word deleted from the context or an unfamiliar word underlined in the context of sentences and paragraphs, and word fluency?

Hypothesis 8.0

> There is no significant relationship within a grade between the Ss' ability to obtain

8.1 a familiar word deleted from the context of a sentence and word fluency;

8.2 a familiar word deleted from the context of a paragraph and word fluency;

8.3 the meaning of an underlined unfamiliar word in a sentence and word fluency;

8.4 the meaning of an underlined unfamiliar word in a paragraph and word fluency.

Summary

At grade 8 level a significant positive relationship was revealed between word fluency and ability to obtain the meaning of an unfamiliar word from the context of a sentence. There was a tendency for the remaining positive correlation coefficients (with one exception) to increase by grade. In grade 4, a low negative relationship between word fluency and ability to obtain the meaning of an unfamiliar word, suggested that, for the younger Ss, stability was not yet established either in the flow of ideas or in their control. While the word fluency tests demanded a rapid flow of words, obtaining meaning for an unfamiliar word required well-developed control of ideas and words. For some tasks, all Ss seemed able to adjust efficiently, but the younger Ss and the Less Proficient reading groups tended to experience some difficulty in sustaining flow and control of ideas according to the demands of the task. Therefore, the null hypothesis 8.3 was rejected for grade 8 and upheld for grades 4 and 6. The null hypotheses 8.1, 8.2 and 8.4 were upheld across the grades.

Summary of findings and conclusions: research question 9

Research question 9

> What is the relationship within grades between how the Ss obtained the unknown word and its quality, either a familiar word deleted from the context or an unfamiliar word underlined in the context of a sentence and a paragraph?

Hypothesis 9.10: for sentences

> There is no significant relationship within grades between the number of meaning cues used by the Ss and the quality of
>
> 9.11 the word elicited to represent a familiar word deleted from the context;
>
> 9.12 the meaning obtained for an unfamiliar word underlined in the context.

Hypothesis 9.20: for paragraphs

> There is no significant relationship within grades between the number of meaning cues used by the Ss and the quality of
>
> 9.21 the word elicited to represent a familiar word deleted from the context;
>
> 9.22 the meaning obtained for an unfamiliar word underlined in the context.

Summary: meaning cues and quality of word response

Although the positive correlation coefficients tended to increase by grade, no significant relationships were determined for a sentence containing either a familiar word deleted from the context or an unfamiliar word underlined in the context. Hence, the null hypotheses 9.11 and 9.12 were upheld.

For paragraphs, all correlation coefficients between the number of meaning cues used and the quality of the familiar word or the meaning of the unfamiliar word elicited by the Ss revealed positive increases by grade. However, only in grades 6 and 8 were the relationships significant between the number of meaning cues and the quality of the familiar word elicited. Therefore, the null hypothesis 9.21 was upheld in grade 4 and rejected in grades 6 and 8: the null hypothesis 9.22 was upheld across the grades.

It appeared that although the number of meaning cues used was in some way related to the word or word meaning obtained, factors other than the number of meaning cues may be more directly related to Ss' success in obtaining word meaning. Whether very proficient readers selected more key meaning cues within the larger number chosen, was not revealed in the study.

Hypothesis 9.30: for sentences

> There is no significant relationship within grades between the number of meaning cues and the reasoning used by the Ss to obtain
>
> 9.31 the familiar word deleted from the context;
>
> 9.32 the meaning of an unfamiliar word underlined in the context.

Hypothesis 9.40: for paragraphs

> There is no significant relationship within grades between the number of meaning cues and the reasoning used by the Ss to obtain
>
> 9.41 the familiar word deleted from the context;
>
> 9.42 the meaning of an unfamiliar word underlined in the context.

Summary: meaning cues and reasoning

For both sentences and paragraphs relationships between the number of meaning cues and their use by way of reasoning were positive with a tendency to increase by grade. For sentences, in grade 6 and 8 the coefficients of correlation were significant for familiar words but not for unfamiliar words. For paragraphs, only in grade 8 was the relationship significant for familiar words; only in grade 6 was the relationship significant for unfamiliar words. Therefore, all four hypotheses were upheld in grade 4. Hypothesis 9.31 was rejected and hypothesis 9.32 was upheld in grades 6 and 8; hypothesis 9.41 was rejected in grade 8 and upheld in grade 6; hypothesis 9.42 was upheld in grade 8 and rejected in grade 6.

These findings seemed to suggest that the Ss' use of meaning cues for the purpose of reasoning was stablizing as the grade level increased. However, it appeared that use of the meaning cues abstracted from the context of sentences and paragraph was not yet perfected.

Hypothesis 9.50: for sentences

> There is no significant relationship within grades between the Ss' ability to reason and the quality of
>
> 9.51 the word elicited to represent a familiar word deleted from the context;
>
> 9.52 the meaning obtained for an unfamiliar word underlined in the context.

Hypothesis 9.60: for paragraphs

> There is no significant relationship within grades between the Ss' ability to reason and the quality of

9.61 the word elicited to represent a familiar word deleted from the context;

9.62 the meaning obtained for an unfamiliar word underlined in the context.

Summary: reasoning and quality of word response

For sentences and paragraphs significant positive relationships between the Ss' ability to reason and the quality of the familiar word elicited or the meaning obtained for an unfamiliar word underlined in the context were revealed across the grades. Therefore, the null hypotheses 9.51, 9.52, 9.61 and 9.62 were rejected.

It appeared that the quality of the familiar word or word meaning elicited, representing the language power of the Ss, was significantly related to the thinking power generated to complete the reading task. That is, the quality of language control indicated by the level of the word or word meaning elicited may also be a reliable indicator of the level of understanding achieved during the processing of word meaning from the context.

Summary of findings and conclusions: research question 10

Research question 10

> Is there a relationship between the Ss' ability to obtain word meaning from the context and personal experience?

Summary

Reference to personal experience was made by Ss across the grades while explaining their responses to the F. W. Tests - Sentences and Paragraphs and to the U. F. W. Tests - Sentences and Paragraphs with comparable frequency for approximately 9 per cent to 12 per cent of the acceptable responses. These references to personal experiences seemed to serve as a reflection upon past events which helped the proficient maturing reader to elaborate his response. Moreover, reference to highly personal experience was peculiar to only a few individuals who supported their responses by its use in such a way that the response tended to be expanded rather than limited by this personal point of view.

Summary of findings and conclusions: research question 11

Research question 11

> What is the relationship between the Ss' ability to obtain a familiar word from the context of a sentence and the position of the deleted word in that context?

Summary

The Very Proficient and Proficient reading groups across the grades obtained word meaning with the greatest efficiency when the missing word was placed near the end of the sentence. In grades 4 and 6 the Less Proficient reading groups tended to be only slightly more successful in obtaining meaning when the deleted word was near the end of the passage rather than near the beginning or near the middle of the context. These findings seemed to suggest that the proficient reader was able to select essential meaning cues while he was processing the context, relating them to each other in such a way that the missing word was called to mind and integrated into the meaning of the context by the end of the first reading. On the other hand, the Less Proficient reading groups tended to have problems obtaining word meaning which seemed not to have been caused only by word placement. Responses of some Ss' also revealed that passages read only once tended to be most frequently supplied with an acceptable word irrespective of word placement; that is, factors other than word placement must be considered in determining reading ease.

Implications of the Study

Implications for reading theory, for the teaching of reading in colleges and in classrooms, and for construction of reading materials were identified from observations made during the individual interviews with the fifty-four Ss and from a study of their verbal responses to the given reading tasks.

Processing of word meaning from the context by intelligent, proficient readers in the study was rapidly completed for some passages and slow and painstakingly for others. Although the most frequently reported processing "time" required to obtain an appropriate familiar word deleted from the context or the meaning of an unfamiliar word underlined in the context was "end of first reading" of the passage, Ss in the Very Proficient, Proficient, and Less Proficient reading groups reported as many as six or seven readings of the context before obtaining meaning. If selection of meaning cues, testing and retesting them as aids to meaning, and evaluating the results are essential elements of the reading process, perhaps there should be less emphasis on the phenomenal speed of the process and greater emphasis on the nature of the process in relation to its purpose in a particular context.

While some attention has been directed by way of research to reading as a cognitive process, concern for the affective process tends to be limited. Ss' responses to sentences and paragraphs suggested that affect was influencing reading behavior. It is possible that some responses classified according to one or more subheadings under use of semantic information might have been appropriately placed within a category labelled "affective approach to the task." By reflecting upon the context in relation to personal experience, to personal feelings about certain elements in the context or to reading in general, Ss tended to reveal their feelings and attitudes. Therefore, although the importance of affect in the reading process was perhaps underestimated in this study, it should not be neglected in the development of reading theory.

Although the validity of cloze procedures to measure levels of comprehension quantitatively has been established, their diagnostic value has not been determined. The classification scheme devised in this study to make a qualitative judgment of a quantitative measure of word meaning derived from context offered one means of determining degree of understanding through judging the level of language control exhibited by the word response. Validation of the scheme through adequate replication and possible refinement of categories should result in a practical ad hoc classification scheme, useful for diagnostic teaching. A teacher does not have time to always ask a child to justify his response but there should be some available means of judging the response according to how much meaning was obtained, instead of merely assessing it as right or wrong.

Interpretation of the reading for meaning 'product' in terms of the level of understanding obtained as a result of the language-thinking process would make it possible to initiate classroom instruction specific to the skill required and at an appropriate level of difficulty to insure success. That there is no single cause for failure to obtain word meaning was revealed in the study: for example, although reasoning was faulty in some responses, it was not possible to determine whether the S was unable to reason or whether factors in the context, such as sentence structure or word placement, were obstructing the understanding. From the standpoint of reading theory, the need for numerous in-depth studies of specific aspects of processing word meaning from particular contexts was pointed up by the present study. From the standpoint of teaching reading, the need for understanding the multi-faceted nature of the reading process was implied by the findings.

The willingness of the Ss to discuss their responses, to state their points of view, and to reveal their thinking concerning how meaning was obtained clearly pointed up the value of helping teachers interact effectively with children. Children, if given the opportunity to "think aloud" about their reading, to share their ideas and opinions, to raise questions while reacting to the reading, can provide teachers with a powerful means of evaluating growth in and through reading.

While the practice of reading for meaning through more effective pupil-teacher interaction tends to be increasing, its realization in classrooms seems to move slowly partly because teachers consider the approach too time-consuming. It may be that teachers tend to adhere to a narrow concept of reading as word recognition, unaware of its vital role in the communication process, demanding meaningful interaction between reader and writer and between different readers. If this charge is true, it appears that those responsible for training teachers in colleges and on the job should increase their efforts to help teachers understand that reading is also a language-thinking process.

There was a tendency for some younger Ss in the study to read the passages aloud. Whether this action was based on need or on habit was not determined. When readers who were unsuccessful in obtaining word meaning following silent reading were asked to read the passage aloud, they were seldom able to complete the task. When asked if reading the passage aloud helped, Ss tended to reply, "sometimes" or "not much." Although the graphophonic information furnished by the context was processed successfully, it appeared to offer little guarantee that the semantic information provided by the context was also being processed successfully.

Oral reading as a means of determining a pupil's level of understanding continues to prevail in many classrooms. It is highly probable that teachers who rely on "round robin" reading do so because they lack understanding of reading as a process. It is possible that there are many less proficient readers such as one S (IQ score 128) in the study who declared that he hated reading because "I have to read to my Mother every night." Furthermore, once launched upon the given reading tasks, this same S seemed to thrive upon the individual attention received as witnessed by his personal and reading behavior.

Individual interviews, where the pupil and teacher interact and evaluate the worth of the reading experience, place heavy responsibility on the teacher to make these precious minutes a valid use of time. While the main purpose of the individual interviews in the study was to obtain information concerning the reading for meaning process, insights gained, relative to the personal, social, and experiential background of each individual, made a lasting impression in addition to providing required information. That the proficient maturing readers in the study were communicating with the writer was obvious by their responses. That less proficient readers might develop these abilities more effectively, if given some individual attention, seemed highly probable. While it may not be possible for classroom teachers to provide regular individual interviews, application of similar techniques through questioning and discussions, in small groups or in large, is within reach of every teacher.

An interactive approach to reading demands proficiency in listening by pupils and by teachers. Listening to the child explain why he thinks the way he does about the meaning of an unfamiliar word in context provides the teacher with a valuable diagnostic technique. As children listen to other children explain how the context aided them in getting word meaning, they tend to learn from each other the usefulness of context.

Whether the Ss in the study received classroom instruction in the use of context was not determined. It was obvious that some Ss were highly efficient in using the context to obtain word meaning; other Ss tended not to be familiar with all five types of embedded contextual devices. Instruction in the use of contextual cues -- syntactic and semantic -- provides children with an opportunity to gain knowledge of the usefulness and the limitations of context as an aid to word meaning.

One of the major deterrents to actual development of skill in using the context may be the lack of adequate reading materials which provide opportunities for developing readers to use the context. Difficulties encountered at the outset of the study in obtaining examples of passages containing obvious contextual devices were reported in Chapter IV. Pupils' texts, readers, and story books should challenge young readers to derive word meaning from the context. Less stringent control of vocabulary in children's reading material would increase dependence on context to provide meaning cues to the advantage of the maturing reader. It would also place heavier demands upon teachers to help children develop meaning vocabulary in the content being read as opposed to skill exercises apart from the normal reading situation.

Difficulties encountered by some Ss attempting to obtain word meaning from the context seemed related to sentence structure rather than to inability to use the meaning cues provided by the context. These findings reinforced the reports of others (Strickland, 1962; Ruddell, 1963; Fagan, 1969) concerning the importance of creating reading materials based on simple language patterns familiar to young maturing readers.

Suggestions for Further Research

From the verbal responses of the fifty-four Ss given the task of obtaining word meaning from context, patterns of reading behavior were inferred. It appeared that these proficient maturing readers derived word meaning from the context by selecting, analyzing, relating, and integrating relevant meaning cues provided by the context. The level of efficiency achieved by group and by grade seemed to be related to the linguistic and cognitive stages of development of the readers and to the ease or difficulty of the context which was processed. Whether proficient maturing readers, in general, process word meaning in ways similar to the processing patterns revealed by the subjects in the study stands as a viable problem for further research.

Further study involving less proficient readers is also essential. By comparing the processes used by less proficient readers to obtain word meaning from context to those used by proficient maturing readers of comparable age or stage of development, possible causes of lower efficiency in processing the context might be obtained. Subsequent direction for curriculum development and for classroom instruction could then be based on knowledge of how maturing readers obtain word meaning from context.

Validity of the classification schemes devised from the Ss' responses to make possible the descriptive analyses could be determined by replications of the study. A more precise description of the meaning cues used by readers at different grade levels would be useful. While there was a tendency for the proficient readers across the grades to use significantly more meaning cues than were used by the less proficient readers, the question persistently arose as to whether the number of meaning cues was in fact the significant factor. It was considered a possibility that in the larger number of meaning cues used by the proficient reader there existed the key meaning cue(s) upon which the meaning of the context largely depended. The nature of key meaning cues, which may be highly individualized for each reader, offers an exciting area of investigation.

In replicating the study, the following suggestion might lead to increased understanding of minimal cues required for obtaining word meaning from context. In the present study two questions were asked following each response. By asking only the first question, "What makes you think so?", increased precision in Ss' reporting of actual cues used to derive word meaning might be obtained. Although the purpose of the second question was to encourage the more reticent S, it is possible that additional cues may have been reported by some Ss but not actually used in processing the context to obtain the word response.

Another interesting question raised by the study was whether the minimal cues required to obtain word meaning in literary-type material were comparable to the minimal cues required to derive word meaning in information-type reading material. It seems possible that proficient maturing readers might require fewer meaning cues for processing the meaning of an unknown word in a story of fiction compared to the processing required for word meaning in a science text. On the other hand, the reverse might be true, if the cues in the narrative, for example, were more remote from the unknown word than the meaning cues in the science article. A study designed to investigate the placement of the unknown word in relation to key meaning cues, in different types of reading materials (i.e. with respect to content and style) should provide some answers to important questions concerning the nature and use of essential meaning cues.

Setting a time limit for the reading of each passage by proficient readers might result in increased use of key meaning cues only. By presenting similar reading tasks under timed and untimed conditions, comparison of the product, the word meaning obtained in relation to the number of key concepts used to derive word meaning, would provide increased understanding of the reading process in terms of purpose.

How proficient maturing readers obtain word meaning from context might also be pursued through combined use of a modern eye-movement camera and introspective techniques. Comparison of readers' reports of how word meaning was obtained to eye movements recorded during the reading should result in increased understanding of the reading process.

Although proficient maturing readers in the study obtained the meaning of unfamiliar words underlined in the context with considerable efficiency, the question of how much meaning would be retained from one exposure to the unfamiliar word in a contextual situation was not determined. A vocabulary posttest, similar to the pretest given in the study, administered after an appropriate interim, might provide an answer to one important aspect of the reading for meaning process.

There seems to be general agreement among reading authorities that reading is a complex process (Stauffer, 1969; Dechant, 1964; Gray, 1960). There is, however, no general agreement as to how the process functions. Attempts to explain the process tend to consider the process, in general, rather than to consider the uniqueness of the process of reading for a specific purpose. Goodman (1973), for example, described reading as a process dependent on the reader's effectiveness in using three cue systems operating "simultaneously and interdependently (p. 25)." In a further explanation, Goodman suggested that reading requires strategies in keeping with the nature of the task. The present study was designed to investigate the strategies used by Ss in three grades to process word meaning from verbal context. Information concerning the strategies used by proficient maturing readers for other specific reading tasks, such as reading for details, for main ideas, for making predictions, and the like, might also be revealed by way of the introspective or retrospective techniques, similar to those used in the study.

Lastly, the following suggestions are presented as research questions for future investigations:

(a) Is there a difference in Ss' ability to obtain word meaning from sentences differing in structure but having embedded within them similar types of contextual devices?

(b) Is there a significant relationship between the S's ability to obtain word meaning from context and his ability to use language, in oral or in written situations? If so, what is significant about the relationship?

(c) Is there a significant relationship between cognitive or learning style and the processing style used by proficient maturing readers to obtain word meaning from context?

(d) How do proficient readers at different ages or stages of development obtain from the context the particular meaning required for:

i) multiple-meaning words (e.g. _bar_, _pitch_, _fast_)?

ii) homonymous words (e.g. _sight_, _cite_, _site_)?

It seems feasible that sets of sentences, containing words such as were suggested in (d) and presented individually as reported by Werner and Kaplan (1950) and by the present study, would provide significant information.

Lohnes and Gray (1972) emphasized the need for reading research "multivariate in measurement, in data analysis, and indeed in philosophy (p. 476)." Research studies designed to investigate the interplay between the reading process and the resulting product should satisfy these requisites. Use of introspective techniques offers one potentially valuable means of approaching this important task. On the basis of numerous in-depth studies, with sufficient replication to make generalizations possible, cumulative information concerning the reading for meaning process should evolve.

Concluding Statement

In the present study patterns of similarity in the processing of word meaning from context were revealed across the grades by proficient readers who used the linguistic information provided by the context to reason the meaning of an unknown word in the context. The tendency for differences in the quality of word meaning derived from the context to decrease by grade suggested further that the acquisition of background experience and growing language power led to more effective use of thinking power in the processing of precise, mature word meaning from context.

The uniqueness of the study may be attributed to application of retrospective techniques for the purpose of exploring how maturing proficient readers obtained a familiar word deleted from the context and an unfamiliar word underlined in the context. Its real significance, however, depends largely upon what happens next. If future investigations enlarge upon the major strengths and overcome the major weaknesses of this study, there is hope that the reading process will be, in time, more fully understood.

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APPENDICES

APPENDIX A

Preliminary Test Exercises

DIRECTIONS FOR TEACHERS ADMINISTERING

WHAT IS THE MISSING WORD?

1. Ask pupils to place their name, grade, school, and date in the spaces provided for this information.

2. Please read the following directions aloud while the pupils read them silently:

DIRECTIONS:

In each of the following sentences there is a missing word as indicated by the blank space. You are asked to decide what the missing word should be in order to complete the sentence. Try to think of a word that fits best and gives meaning to the sentence.

Here is an example:

WORK

Patricia began to _______ hard when she realized that the others had finished and were ready to go out on the playgrounds for a game of dodge ball.

The word "work" fits best because, according to the rest of the sentence, the others seem to have been working since they are finished and can now go out to play. If Patricia wants to play, she will also have to work.

Now try this example on your own. When you have finished, we will check it together. Complete the following sentence by filling in the blank with one meaningful word.

On Aunt Mary's countenance there is always a __________ but poor Uncle Jed's face never loses its frown.

When the pupils have finished, say, "What word did you put in the blank? What makes you think SMILE is the right word?"

Do you understand what you are to do? Are there any questions? If not, you are now ready to try and supply a missing word in each sentence in the following exercise. Read each sentence carefully and try to fill in each blank with a suitable word. The exercise is not timed. Do your best!

Begin.

WHAT IS THE MISSING WORD?

NAME .... DATE ....

GRADE .... SCHOOL ....

DIRECTIONS:

In each of the following sentences there is a word missing as indicated by the blank space. You are asked to decide what the missing word should be in order to complete the sentence. Try to think of a word that fits best and gives meaning to the sentence.

Here is an example:

WORK

Patricia began to ______ hard when she realized that the others had finished, and were ready to go out on the playgrounds for a game of dodge ball.

The word "work" fits best because, according to the rest of the sentence, it appears that the "others" have been working since they have finished and can now go out and play. If Patricia wants to play, she will also have to work.

Now, try this one on your own. When you have finished, we will check it together. Complete the following sentence by filling in the blank with one meaningful word:

On Aunt Mary's countenance there is always a __________ but poor Uncle Jed's face never loses its frown.

Complete each of the following sentences by supplying the missing word in the blank space provided:

1. After a long day at the beach the older folks were ________ to go home, but the children begged them to stay longer.
2. When the temperature in the sky rises to around freezing, flakes of _________ form and fall to cover the earth.
3. The trip home was ________, for there were no storms, no wild animals emerging from the mountain-sides, and few unfamiliar license plates to identify on passing motor cars.
4. Even though John ate a hearty breakfast, he was extremely ___________ by ten o'clock.

5. As the flames leaped around him, Bob tried ________ to open the door by putting all his weight against it and kicking it hard, but to no avail; it would not budge.

6. Our family pet, a long-haired poodle -- wise and adorable, knowing and __________ -- travels in the car with us on every trip, long or short.

7. Instead of asking his uncle for __________, young Jans acted as if he had done no wrong.

8. The skater's __________ was almost perfect, for he made few errors in any of the figures required at the Winter Games.

9. Sugars and starches _________ the body with necessary energy to keep us working, thinking, and enjoying life; that is, they provide basic life-giving needs.

10. ___________ we knew what to expect from Francis, but sometimes he was unpredictable.

11. No one breathed _________ until the wandering lion was safely back in his circus cage.

12. Fresh vegetables are _________ (conveyed in large vans) to the local market at least twice a week.

13. At first the chipmunk was cautious and sky, but gradually he became _________ and friendly.

14. As Robin ___________ left his home, he wistfully looked back, and then sorrowfully set out to seek a new life in a new country.

15. If it continues to rain all night, the highways will be too ___________ for safe travel by morning.

16. That band of leather or metal strapped around a dog's neck, often irritating yet glamorous with its silver studs and sparkling jewels, is usually called a __________, although it might better, at times, be named a choker.

17. Objects move only when a _________ (a push or a pull) acts upon them.

18. King Albion _________ his kingdom for over twenty-five years.

19. If you wish to _________ in your chosen career, you must be prepared to work hard.

20. A small quantity of _________, or venom, was taken from the rattler and injected into a rabbit to find out how it would react.

21. In our country most trees are completely _________ until they foliate in the spring.

22. Hastily the boys __________ to the police that they had seen a man who closely resembled the wanted bank robber, pictured in last night's paper.

23. Canada is ___________ in natural resources; that is, we have a good supply of minerals, waters, and forests.

24. Because he had waited so long for the big day to arrive, Freddy now moved __________ into action.

CAN YOU FIND THE MEANING?

NAME .... DATE ....

GRADE .... SCHOOL ....

DIRECTIONS:

This is an exercise to find out how well you can determine the meaning of an unfamiliar word when you meet it in a sentence. In each of the following sentences the unfamiliar word is represented by a nonsense word. In its place, you are asked to substitute a word that seems to fit best in order to give meaning to the sentence. You may not all use exactly the same word but the nonsense word should be replaced by a word that makes sense, rather than nonsense, in the given sentence.

Here is an example:

Sammy was ZOV but his brother Larry was slim.

ZOV means fat.

In the above sentence ZOV seems to mean "fat" or "stout" because the word "but" is a signal, letting the reader know that the writer is changing "direction" in his thoughts or ideas. Therefore, if Larry is "slim", Sammy must be different; he must be the opposite, "fat" or "stout".

Now, you try the next one. Read the sentence carefully and then decide what the nonsense word KAGIBETLY means in that sentence. Put your answer in the blank space given below the sentence. We will check it together when everyone has finished.

Because he had waited so long for the school Field Day to arrive, George now moved KAGIBETLY into action.

KAGIBETLY means __________.

Each of the following sentences contains a nonsense word. Read each sentence carefully, replacing the nonsense word by a word that gives meaning to the sentence. Put the word you have chosen in the blank space provided below each sentence.

1. Although snakes are usually considered evil creatures, some people like to keep them as YUGS.

   YUGS means ___________.

2. When Johnny disturbed the class, the teacher had to KOMANE him.

   KOMANE means ___________.

3. At the hockey game everyone was TUNVING for the home team of Loxville.

   TUNVING means ___________.

4. Mary was REFDLY when she first moved to Toronto and found herself among so many strangers and away from her friends.

   REFDLY means ___________.

5. It was a very ZEBMOD evening; the children were all in bed, the wind had ceased its constant, irritating thrusts, and even the birds were content to enjoy the silence of the June evening.

   ZEBMOD means ___________.

6. Because it was after midnight, Bob and Joe crept WOPZEVLY up the stairs to their bedroom.

   WOPZEVLY means ___________.

7. The fatal JOHOSTER occurred at a sharp curve in Number 9 Highway.

   JOHOSTER means ___________.

8. Aunt Mamie XARIBED dogs if they were dirty, but she enjoyed them if they were clean and not too barky.

   XARIBED means ___________.

9. Mr. Smith's class in science was so thoroughly fascinated, so completely absorbed, and so MIGUDLY involved in their experiments that they failed to hear the bell ring.

   MIGUDLY means ___________.

10. Because it was a very cold night, we truly SYMETLEBED Mr. Fraser's offer of a ride to the hockey game.

    SYMETLEBED means ___________.

11. Mary recognized the first tune played by the school band, but the next two were MAFIBIG to her.

MAFIBIG means __________.

12. When you are WOIMING badminton -- a game similar to tennis -- you use a great deal of energy.

WOIMING means ________.

13. Joseph had no feeling of POLIKT, no ill-will, in his heart for his brothers who had wronged him.

POLIKT means ________.

14. A ZIVE can fly about safely in pitch blackness, even where there is not the slightest glimmer of light.

ZIVE means ________.

15. BROGHLY the wind dashed huge waves against the frail little boat, tossing it and its crew of three frightened boys about in stormy lake.

BROGHLY means _________.

16. The PIBWOST air, fresh and crisp and still at that early hour, gave Mr. Holt the vigor he needed for his long, tiring job.

PIBWOST means __________.

17. As the dark clouds rolled away after the severe thunderstorm, a VIENUG of blue sky could be seen in the eastern sky.

VIENUG means _________.

18. We will meet you in the BITON, the entrance hall of the Queen Anne Hotel.

BITON means ________.

19. KUGROBS, which are the hardened remains or traces of plants and animals, were often found on the prairies by early pioneers.

KUGROBS means ___________.

20. The wolf ate ZOTAGLY until nothing was left of the white rabbit; tomorrow he would not be hungry at all.

ZOTAGLY means __________.

21. Storm clouds, which had gathered earlier in the morning, had RITWERTED by noon, leaving the sky clear.

RITWERTED means __________.

22. Because he had almost forgotten his promise to be home by nine o'clock, Billy LAGZUKLY left the skating rink.

LAGZUKLY means __________.

23. Although Marie cut her hand severely on a VALJIE piece of glass, she did not cry.

VALJIE means __________.

24. The TUPY around a magnet in which metal objects are affected is commonly known as the magnetic field.

TUPY means __________.

WHAT IS THE MISSING WORD?

NAME .... DATE ....

GRADE .... SCHOOL ....

PART I

DIRECTIONS:

In each of the following paragraphs one word has been omitted. Read the paragraph carefully and decide what the missing word should be in order to complete the intended meaning of the passage. Put the word in the blank space.

1. On a clear night you can see streaks of _________ flashing across the sky. These streaks are meteors. Some people call them "shooting stars." The best time to view meteors is after midnight, although you can see them in the early evening, too.

2. Jonathan was a very ________ young man. He was considered small-minded by those who knew him well. In fact, when his friends were especially annoyed with him, they openly called him piggish.

3. Reefs and small islands consisting of __________ are common in the South Seas. It has been formed from the skeleton of very small sea animals. In color it may be red or pink. Sometimes it is used for making jewellery.

4. Each time Frank urged Trixie toward the fence, she would suddenly limp as though she were lame. Frank felt certain that the horse was __________. As soon as they moved away from the fence, Trixie had no sign of a limp.

5. After three days with little or no food, the boys were happy to reach home. That evening they _________ themselves on the roast beef and apple pie that Mother had prepared for them. They felt like stuffed owls.

6. Like many great men, Sir Winston Churchill spent his later years painting and reflecting on past glories. He also wrote his __________. They were published, not in a single volume, but in several volumes. Sir Winston Churchill's autobiography probably records more facts and events, personally witnessed by this great man, than the life story of any other statesman in history.

FROM NONSENSE TO MEANING

NAME .... DATE ....

GRADE .... SCHOOL ....

PART II

DIRECTIONS:

In each of the following paragraphs one word has been changed to a nonsense word. Read the paragraph carefully and decide what word you would use in place of the nonsense word in order to read the passage with complete understanding. Put the word in the blank provided below each paragraph.

1. The painter put down his brush, wiped his hands on a cloth which had been dipped in turpentine, and stood back to examine his work. As he admired the BLIJELY painted walls and ceiling, he felt rather proud. The old house was beginning to take on a "new" look.

   In this paragraph BLIJELY probably means ____________.

2. Mary and John chatted freely for almost an hour. Then they TORMED into silence. Both had suddenly remembered that this was the last time they would see each other for several months.

   In this paragraph TORMED probably means ____________.

3. QUIFORDLY Susan walked up the steps of the school. She had studied hard. Susan felt certain that she was prepared for the mathematics examination which Mr. James was giving them first thing in the period.

   In this paragraph QUIFORDLY probably means ____________.

4. Early this morning LIVOPNU of a large shipment of drugs was made by the Mounted Police. When the plane landed, the Police were at the airport. Before the drug carriers were off the plane, they were spotted. Their luggage was searched and the fateful goods was found among their belongings.

   In this paragraph LIVOPNU probably means _________.

5. Next winter it would be fun, indeed, to re-live the summer vacation by enjoying Father's pictures which he

would project on a screen. Davy decided that he would add to that enjoyment by keeping a POVIN of the most exciting events of the holiday. Each evening he would write a brief account of the most important things that they had seen and done that day.

In this paragraph POVIN probably means __________.

6. George WERKONDLY found fault with the way his wife cooked his meals. It was not a matter of complaining once in a while when, for example, he might be overtired. It seemed that it had become a bad habit with George.

In this paragraph WERKONDLY probably means __________.

APPENDIX B

F. W. Tests - Sentences and Paragraphs

and

Intended Meanings for Responses to F. W. Tests - Sentences and Paragraphs

F. W. Tests - Sentences[a]

Test 1 (Blanks)

1. King Albion / ----- ruled his kingdom / for over twenty-five years. (L/E)
2. Objects / move / only when a ----- / (a push or a pull) / acts upon them. (Syn.)
3. Standing in line with the other runners, / Peter took / a ----- breath / and waited patiently for the starting whistle. (L/E)
4. Our family pet, / a long-haired poodle / -- wise and adorable, / ----- and lovable -- / travels in the car with us on every trip, long or short. (Syn.)
5. Since the skater / made few errors / in any of the figures / required at the Winter Games, / the judges / considered his ----- very superior and worth / of a high score. (C/E)
6. With the aid of crutches, / Andrew ----- made his way / around the house, / avoiding basement stairs and slippery floors. (D/D)
7. In our country / most trees / are completely / ----- until / they foliate / in the spring. (Contrast)
8. Sugar and starches / ----- the body / with necessary energy / to keep us working, thinking, and enjoying life; / that is, they provide / basic life-giving needs. (D/D)
9. ----- we knew what to expect from Frank, / but / sometimes / he was

---

[a] Type of contextual clue specifically embedded in each item stated in parentheses.

Slash separates each reported meaning cue.

unpredictable. (Contrast)

10. If you wish to / ----- in whatever task you set out to do, / you should be prepared to work hard. (C/E)

Test 2 (Nonsense)

1. The fatal JOHESTE / occurred / at a sharp curve / in Number 9 Highway near Rogerville. (L/E)
2. Raising the gun slowly to his shoulder, / the hunger / YOXIGLY took aim / and fired / at the motionless, young buck. (L/E)
3. Instead of finishing the jigsaw puzzle, / Arthur GIOPRED it / partially done / and scattered around his room. (Contrast)
4. Because Mary Ellen was extremely BOUCREG, / she did not ask / her teacher / or her classmates / for some help / in solving the math problems / that she could not do. (C/E)
5. A bat / can fly / about safely / in pitch ZOVEDER, / even when there is not the faintest glimmer of light. (Contrast)
6. Ivor Venki / JYPROLY left his parental home; / wistfully / he looked back, / and then sorrowfully / he set out to seek a new life / in an unknown country. (Syn.)
7. Since the wolf had not eaten for several days, / he tore the rabbit apart / and ZOJUGLY devoured him / in a few mouthfuls. (C/E)
8. The PIBWOST air, / which was fresh / and crisp / and still / at that early hour, / gave Mr. Holt the vigor / he needed for his long, tiring job at the office. (D/D)
9. The TUPOCIL around a magnet / in which metal objects / are affected / is commonly known as the magnetic field. (D/D)

10. Everyone in Mr. Smith's science class / was thoroughly fascinated, / completely absorbed, / and deeply MIGUDED in their individual projects. (Syn.)

F. W. Tests - Paragraphs

Test 1 (Blanks)

1. On a clear night / have you seen streaks / of ----- flashing across the sky? / Those streaks are called meteors. / Some people call them 'shooting stars'. / Although you see them early in the evening, the best time to see them is after midnight. (L/E)
2. Father, slowly and painstakingly, / crawled up / the steep cliff to where Roger and the week-old kid, separated from its mother, were awaiting rescue. / Because one false move / might mean the difference between safety and disaster, / he ----- edged his way, / step by step, / toward the frightened pair. / As he reached the narrow ledge where they sat huddled close, even the kid bleated a shaky welcome. (C/E)
3. Jonathon was considered small-minded by those who knew him well. / In fact, when his friends were especially annoyed with him, they openly called him piggish, / for he thought mainly of his own desires and needs. Jonathon was, indeed, a very ----- young man. (Syn.)
4. Often we think of castles as being large, splendid mansions where lords and ladies lived in luxury. / Actually, most castles were cold, dreary, uncomfortable places. / ----- were they warm or well-

lighted. / During the winter cold winds from the north beat fiercely against the paneless windows and howled against the lofty towers. (Contrast)

5. After three days with little or no food, the boys were happy to reach home. / They were famished and almost starving. / That evening they ----- themselves on delicious roast beef and fresh apple pie / that Mother had prepared for them. / They went to bed early that night with full stomachs and contented minds. (D/D)

Test 2 (Nonsense)

1. Susan had studied hard. / She felt quite certain / that she was prepared for math test which Mr. James was going to give them first thing Tuesday morning. / Therefore, she walked RORGOLY up the step of the school as the first bell rang. (C/E)
2. Mary and John chatted gaily for almost an hour. / Then they lapsed into silence. / Both of them suddenly TOIRMED that this was the last time they would see each other until Easter, or maybe even longer. / If only John's father had not been moved to Winnipeg, all would have been well. (Contrast)
3. When the plane landed, the police were at the airport. / Before the suspects were off the plane, / they were spotted and held until their luggage had been thoroughly searched. / Thousands of dollars' worth / of BIVEDPU jewels / and valuable papers, / stolen from a wealthy Vancouver business man, / were found in their posession. The men were arrested and taken to police headquarters

for further questioning. (D/D)

4. With a sigh of relief the painter put down his brush and wiped his hands on a cloth which had been dipped in turpentine. / He welcomed a pause and the chance to stand back and inspect his work. / As he BLIJELED the freshly painted walls and ceiling, / he felt rather proud. / The old house was beginning to take on a "new" look. (L/E)
5. Next winter it would be fun to recall the summer vacation by enjoying Father's pictures viewed on a screen. / Davy decided that he would add to that enjoyment / by keeping a POVINNE of the most exciting events / of the holiday. / Each evening he would write a brief account of the most important sights they had seen that day, / as well as report on activities they had shared together. (Syn.)

Intended Meanings for Responses to F. W. Tests - Sentences and Paragraphs With Thorndike & Lorge Word Frequency Count

For Sentences

Item No.	Test 1 (Blanks)	T. & L. Word Count	Test 1 (Nonsense)	T. & L. Word Count
1	ruled	AA	accident	A
2	force	AA	carefully; thoughtfully	A;
3	deep	AA	left	AA
4	smart; clever	A; 33	shy	21
5	performance; act	35; AA	darkness; blackness	A; 6
6	carefully; cautiously	A; 13	sadly	31
7	bore	A	quickly; greedily	AA; 3
8	supply	AA	morning	AA
9	usually; generally	AA; A	area; space	A; AA
10	succeed	A	involved; interested	44; AA

For Paragraphs

Item No.	Test 1 (Blanks)	T. & L. Word Count	Test 2 (Nonsense)	T. & L. Word Count
1	light	AA	smartly; confidently	A; 4
2	carefully; cautiously	A; 13	realized	AA
3	selfish	20	precious	A
4	seldom	A	admired; examined	A; A
5	gorged; stuffed	9; A	diary; log	9; A

[a] AA to 20: Grade 4.
AA to 6 : Grade 8.

APPENDIX C

List of Unfamiliar Words: Vocabulary Pretest

List of Unfamiliar Words: Vocabulary Pretest[a]

orange
puddle
eyelash
lecture
haste
priceless
lotus
stave
bewail
repose
seclude
recede
ambergris
limpet
flaunt
incrustation
retroactive
philanthropy
piscatorial
milksop
harpy
depredation
homunculus
sudorific
parterre
afflict
flout
raze

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[a] Words selected from the Stanford-Binet Vocabulary Test, the W.I.S.C. vocabulary subtest, and the Peabody Vocabulary Test.

APPENDIX D

U. F. W. Tests - Sentences and Paragraphs

U. F. W. Tests - Sentences[a]

Set 1

1. The lotus, a water lily grown in Egypt, / was used in ancient Egyptian religious ceremonies.
2. The lotus is a member of the water lily family / and grows best in Egypt or in some parts of Asia.
3. The cup-like blooms / of the lotus floated / on the surface / of the shimmering water.
4. Because the Egyptians loved its cup-like blooms, / the lotus was often seen in their art or religious ceremonies.
5. Some kinds of water lilies grow in this country / but the lotus prefers a warmer climate, such as Egypt or parts of Asia.

Set 2

1. Several staves, or curved pieces of wood, / fell out of the sides / of the old rain barrel by the side of the cottage.
2. Staves may be several things but perhaps you might see them most frequently as curved pieces of wood / that form the sides / of a wooden barrel.
3. Scattered around the yard / were the staves of the old wooden barrel.

---

[a] Types of embedded contextual clues per set of sentences were: (1) Synonym; (2) D/D; (3) L/E; (4) C/E; (5) Contrast.

4. Because its curved wooden staves had dried out in the sun, / the old rain barrel fell apart / and lay scattered, here and there, in the back yard.
5. In the hot dry sun, the wooden staves of the old barrel fell apart / while the steel sides of the other barrel kept it firm and strong in any kind of weather.

Set 3

1. The perfume industry has been aided considerably by the use of ambergris, / a waxy substance / discharged from the body of the sperm whale.
2. From the body of the sperm whale, / ambergris, which is a waxy substance, / is extracted for use in the making of delicate perfumes.
3. Ambergris is discharged by the sperm whale. /
4. When it was discovered that ambergris was very useful in making perfume, / this discharge from the sperm whale / became extremely valuable to whale hunters.
5. For the sperm whale, ambergris is a means of getting rid of indigestible substances; / for man, it is a means of preserving the scent of delicate perfumes.

Set 4

1. An incrustation, a hard coating / of dry rust / now covers the ornamental figures / on the once shiny, black gate of Aunt Susanne's front yard.
2. An incrustation of hard dry dust / now covers the

ornamental figures / on the big, iron gate that used to welcome us to Aunt Susanne's comfortable, old home.

3. A hard incrustation now covered / the old iron pot that lay in the fence corner.
4. You could no longer imagine what the surface / of the once beautiful iron pot might have been like, / for an incrustation now almost completely hid any sign of a design.
5. Years ago the big black gate on Aunt Susanne's front yard fence used to welcome us / but now a hard, dry incrustation hides its former charm.

Set 5

1. Tom and Mary mourned / when their pet cat, / Ginger, died; they bewailed his death / for a long, long time.
2. With a mixture of salty tears / and silent sadness, / Marianne bewailed the loss / of her pet cat, Ginger.
3. Tom and Mary bewailed the loss / of their beloved cat, Ginger, / for a long, long time.
4. Since Ginger, the favorite family pet, / had been gone for over a month, / Tom and Mary bewailed their loss less frequently each passing day.
5. Marianne was not bewailing Ginger's sudden death; / instead, she was putting forth a brave effort / to believe that her beloved pet / was merely on some great adventure and would soon be home again.

Set 6

1. After dinner / Grandpa reposes, or has a little rest, / before watching his favorite TV programs.
2. Eyes closed / and stretched out in his favorite chair, / Grandpa reposes for an hour or so / before watching his favorite TV programs.
3. After dinner / Grandpa / likes to repose in his easy chair / by the fireplace.
4. Because he was tired after dinner, / Grandpa reposed for almost an hour / before watching his favorite TV programs.
5. While Grandpa reposes in his easy chair in the living room, / Grandma works in the kitchen, cheerfully and lovingly preparing the evening meal.

Set 7

1. Whenever he gets a chance, Mr. Peacock / flaunts, or shows off, / his beautiful feathers / for all to admire.
2. Mr. Peacock / flaunted his beautiful feathers / by strutting up and down among the visitors in the park.
3. Mr. Peacock / flaunts his tail feathers.
4. When Mr. Peacock / saw us admiring him, / he flaunted his beautiful feathers / for all to enjoy as much as possible.
5. While Mr. Peacock / proudly flaunts / his gorgeous feathers, / Mrs. Peacock walks, head down, as if aware of her plain gown.

Set 8

1. Poor young Jordon was flouted by the rest of the gang; he was treated with contempt, / he was scorned, / and he was insulted by all of them.
2. With words of anger, insult, and contempt, / young Jordon was flouted by the rest of the gang / who continued to raid the neighborhood gardens and apple trees, even though he had decided to stop.
3. Jesus was flouted by the Roman soldiers / standing near the Cross.
4. Because he had decided to "go straight" from now on, / Jordon was flouted by the "tougher" members of the gang who scoffed at his softness.
5. Although Jordon was flouted by some of the gang, / not all of the boys shared the same feeling; secretly, at least, they admired him for his courage in confessing to the theft.

Set 9

1. In our family the expert fisherman, / the man with piscatorial skill, is my brother, Bill.
2. Piscatorial skill, better known, perhaps, as the ability to catch fish with considerable success, / was what my Uncle Ambrose seemed best known for in our town.
3. With amazing piscatorial skill, / young Billy cast his line.

4. Since Uncle Ambrose usually caught a large number of fish, / he was considered to have great piscatorial skill.
5. My Uncle Dexter was a very ordinary fisherman, / but my Uncle Ambrose was widely known for his piscatorial skill.

Set 10

1. Jimmy's hands were given a perfunctory washing -- a mechanical, disinterested wetting / -- before he appeared at the dinner table, hungry and full of chatter about the morning's activities.
2. Before meals Jimmy gave his hands and face a perfunctory washing by disinterestedly / running the slippery soap through his fingers / and letting a few drops of water trickle over them / before he reached for the tap to shut off the offensive liquid.
3. Seven year old Jimmy / gave his hands and face / a perfunctory washing before lunch.
4. Because he seemed to dislike or fear the feel of soap and water on his hands and face, / my brother, Jimmy, would give them but a perfunctory wetting before he appeared at the dinner table.
5. Although Mother asked Jimmy to wash his hands thoroughly / before coming to the dinner table, / he gave them but / a perfunctory wetting, before he appeared, hopeful that he would safely pass inspection.

Set 11

1. Teasingly, the boys told Sara that, if she were not careful she would become, in her old age, a harpy -- a bad-tempered, greedy old woman.
2. A shrewish voice and greedy ways earned for poor, old Mrs. Svenson the uncomplimentary title of village harpy.
3. No woman likes to be called a harpy.
4. Because she was greedy and always snatching Trixie's tidbits, the boys called their pet crow a real harpy.
5. Instead of being generous and kind, a harpy is usually selfish, greedy, and often quarrelsome.

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[a] Set 11 was constructed for possible use in the study but the items were not required by any S.

U. F. W. Tests - Paragraphs[a]

1. Before the boys went fishing they were anxious to find some good bait. / Along the seashore they found just what they needed. Clinging to the rocks / were limpets of various shapes and sizes. / These seashells made excellent fishing bait. (Syn.)

2. Most women love perfume. / However, if it were not for ambergris, they could not enjoy its lasting pleasures. / The delicate scent of orange blossoms, lilacs, and other spicy flowers would soon be lost, / if it were not for this waxy substance / obtained from the body of the sperm whale. (C/E)

3. Mr. Stout was rich but he was by no means miserly. / To those in need he was continually lending a helping hand. / At Easter or at Christmas a large basket of food and clothing might arrive unannounced at the door of some needy home. / Each year he gave large sums of money to worthy organizations and well-established charities. Indeed, Mr. Stout was widely known for his philanthropy. (D/D)

4. Jamie, in the eyes of the other boys, was a real milksop. He rarely played ball or hockey. / Even when he did, he always seemed to end up crying / because someone had knocked him down or the ball had hit him or something. / It appeared that poor Jamie would never become a man like the rest of us. (D/D)

5. Napoleon, the "Little General" in the cocked hat and fancy

uniforms, led his loyal army across Europe and back, / winning victory after victory. / He created a vast empire for the French, making himself the emperor. / While it is true that Napoleon may have been an homunculus with respect to size, it is certainly not proper to consider him a little man when speaking of his achievements. (Contrast)

6. Mary was not too popular with her classmates. / It was true that her father owned the best dry goods store in town / and could provide her with more pretty, new dresses than anybody else could afford. / It was not necessary, however, for Mary to flaunt every new outfit before everybody with such an air of superiority. / In fact, if Mary would only realize it, she was disliked instead of envied, on this account. (C/E)

7. All afternoon the water, in huge rolling waves, edged its way further and further over the rocks and on to the shore. / By evening the beach was almost deserted, for the waves and the water had won, having completely hidden the rocks and covered the white sand. / Within a few hours, however, the tide would recede, / leaving the shoreline once again to the holidayers, for another day. (Contrast)

8. Being a New Canadian is not always an exciting adventure. / Sometimes Annette felt completely left out of the fun things enjoyed by most of the boys and girls in her class. / Some of the girls openly poked fun at her strange accent and her unusual

clothes. / The boys simply ignored her. / For the first few months Annette felt like that man Robinson Crusoe whom she had been trying to read about. / Although she was not on an island, / she was equally secluded; she was isolated and shut off from the exciting events and much yearned for friendships, / so close at hand yet so far away. Surely it would not always be like that. (Syn.)

9. Throughout the centuries great cities have been destroyed in a variety of ways. / The Romans, as conquerors, often razed the finest cities of the enemy. / After erasing the proud city, they would sometimes sow it to salt. / In more recent times, large cities have been totally demolished by fires, earthquakes, and bombings. / In spite of serious destruction, / however, many of them have been rebuilt to proudly boast a new city more beautiful than the old. (Syn.)

10. For many years Joseph Jones Jr. suffered from a peculiar ailment for which doctors could find no cure. / He was unable to walk without considerable agony. / At night he was especially distressed by the pain in both legs. / However, thanks to modern medicine, some relief has been found for this malady. / Joseph Jones Jr. is no longer seriously afflicted with aches and pains in his legs. (L/E)

11. Georgie loved to go fishing, especially with Uncle Ambrose an expert fisherman. / All that he knew about fishing, he had

learned from his Uncle Ambrose. / How to choose the right hook, / how to put the bait on it, / and how to cast the line; / all these things his uncle had taught him. One of the most important lessons he had already learned well; patience is a must, if you wish to gain piscatorial skill to match that of Uncle Ambrose. (D/D)

12. Having quickly disposed of his homework, / Johnny tossed his books in the corner / and made for the bathroom / with his mind almost entirely on the eight o'clock basketball game. / With only / a perfunctory glimpse in the mirror, / he ran the comb through his long, thick hair. / He straightened his collar as he headed for the stairs. / After assuring his Mother that he would not be late, he hurried down the front steps. (L/E)

13. According to the news report on TV last night, the printers who have been on strike for almost a month have finally arrived at an agreement with the publishers. / The number of working hours per week will be reduced and their monthly pay will be increased. / In addition, this increase in pay will be retroactive to last December, / providing the men with extra money for the two months past / as well as for the months ahead. (Contrast)

14. Through the centuries war has brought unnecessary suffering to millions of people in many lands. From early times to the present century, invading armies have robbed farmers of crops and animals. In towns and cities, shops have been plundered and public buildings stripped of precious art and other treasures. In more recent

times, similar depredation has been witnessed by way of civil strife, with street riots and lootings, to say nothing of the shattering losses to business and to family life.[b] (D/D)

15. Overhead the mid-day sun blazed down unmercifully upon the naked backs of the men, bent by constant toil in the unbearable heat. Like their master, the sun felt no pity and had no mercy. And, although the day was but half-spent, the air -- motionless, hot, and humid -- reeked with the stench of their sudorific bodies. (D/D)

16. Since curtain time was less than ten minutes away, the people were pressing into the theatre. As usual, the parterre was crowded. Being on the main floor under the balcony, it held large numbers of the chattering crowd until they were shown to their seats by the busy ushers. (D/D)

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[a] Type of specifically embedded contextual clue in parentheses.

[b] Items 14 to 16 were constructed for possible use in the study but were not required by any S.

APPENDIX E

Frequency Unfamiliar Words Used in U. F. W. Tests - Sentences and Paragraphs

Frequency Unfamiliar Words Used in U. F. W. Tests - Sentences and Paragraphs

Unfamiliar Word Sentences	No. Ss using unfamiliar word		
	Grade 4	Grade 6	Grade 8
lotus	17	10	6
stave	18	16	15
ambergris	0	4	9
incrustation	1	6	6
bewail	18	15	18
repose	14	12	15
flaunt	4	5	1
flout	0	4	2
piscatorial	11	11	9
perfunctory	7	7	9
Unfamiliar Word Paragraphs			
limpet	18	18	13
ambergris	17	14	9
philanthropy	1	4	10
milksop	0	0	3
homunculus	0	0	1
flaunt	15	12	13
recede	17	13	6
seclude	4	6	2
raze	0	4	12
afflict	0	1	3
retroactive	0	1	0
piscatorial	7	7	9
perfunctory	11	10	9

APPENDIX F

Interscorer Reliability for

1. Classification of Word Responses
2. Scoring Meaning Cues and Reasoning

Table 7.1

Percentage of Agreement Between Investigator and Independent Judges in the Classification of Word Responses

Independent Judges	Percentage of Agreement F. W. Tests - S. & P.	 U. F. W. Tests - S. & P.
1[a] + 2	93.23	92.30
1 + 3	97.69	97.42
2 + 3	92.52	91.89

[a] Investigator

Table 7.2

Percentage of Agreement Between Investigator and Independent Judges: Scoring Meaning Cues and Reasoning

Independent Judges	Percentage of Agreement F. W. Tests - S. & P.	 U. F. W. Tests - S. & P.
1[a] + 2	92.85	91.89
1 + 3	86.79	85.57
2 + 3	88.89	88.89

[a] Investigator

APPENDIX G

Two-Way Analysis of Variance on Selected Variables by Group and by Grade

Table G.1

Two-Way Analysis of Variance on Selected Variables by Group and by Grade

1. Variable: Vocabulary Scores (C.T.B.S.)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A		2		43.55	.00
B	12822.40	2	6411.22	329.89	.00
AB	22.81	4	5.70	0.29	.88
SE	874.56	45	19.43		

2. Variable: Comprehension Scores (C.T.B.S.)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	5282.19	2	2641.09	130.74	.00
B	14465.90	2	7232.97	358.04	.00
AB	80.25	4	20.06	0.99	.42
SE	909.06	45	20.20		

3. Variable: IQ Scores

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	3572.44	2	1786.22	20.39	.00
B	1625.00	2	812.50	9.27	.00
AB	253.06	4	63.27	0.72	.58
SE	3767.25	45	87.61		

4. Variable: Scores F. W. Tests - Sentences (Blanks)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	206.96	2	103.48	7.68	.00
B	441.94	2	220.97	16.41	.00
AB	16.39	4	4.10	0.30	.87
SE	606.02	45	13.47		

5. Variable: Scores F. W. Tests - Sentences (Nonsense)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	470.06	2	235.03	15.43	.00
B	413.86	2	206.93	13.59	.00
AB	12.94	4	3.24	0.21	.93
SE	685.35	45	15.23		

6. Variable: Scores F. W. Tests - Paragraphs (Blanks)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	56.34	2	28.18	5.96	.01
B	84.12	2	42.06	8.89	.00
AB	29.55	4	7.39	1.56	.20
SE	212.84	45	4.73		

7. Variable: Scores F. W. Tests - Paragraphs (Nonsense)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	126.34	2	63.17	14.11	.00
B	65.45	2	32.72	7.31	.00
AB	3.55	4	.89	.20	.94
SE	201.51	45	.45		

8. Variable: Total Scores F. W. Tests - Sentences

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	1282.56	2	641.28	19.07	.00
B	1680.00	2	840.00	24.97	.00
AB	15.44	4	3.86	0.11	.98
SE	1513.56	45	33.63		

9. Variable: Total Scores F. W. Tests - Paragraphs

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	349.02	2	174.51	12.71	.00
B	292.02	2	146.01	10.64	.00
AB	40.66	4	10.64	.74	.57
SE	617.68	45	13.73		

10. Variable: Missing Word Scores Synonym Type (F.W. Tests - Sentences and Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	246.34	2	123.17	9.37	.00
B	148.78	2	74.39	5.66	.01
AB	32.88	4	8.22	0.63	.65
SE	591.34	45	13.14		

11. Variable: Missing Word Scores Contrast Type (F. W. Tests - Sentences and Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	142.82	2	71.41	8.46	.00
B	196.27	2	98.13	11.63	.00
AB	20.73	4	5.18	0.61	.65
SE	379.68	45	8.44		

12. Variable: Missing Word Scores Direct-Description Type (F. W. Tests - Sentences and Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	66.27	2	33.13	6.20	.00
B	124.71	2	62.36	11.67	.00
AB	12.39	4	3.10	0.58	.68
SE	240.52	45	5.34		

13. Variable: Missing Word Scores Cause-Effect Type (F. W. Tests - Sentences and Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	176.04	2	88.02	15.96	.00
B	179.60	2	89.80	16.28	.00
AB	9.39	4	2.35	0.43	.79
SE	248.18	45	5.52		

14. Variable: Missing Word Scores Language-Experience Type (F. W. Tests - Sentences and Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	83.60	2	41.80	8.35	.00
B	58.94	2	29.47	5.88	.01
AB	8.95	4	2.24	0.45	.77
SE	225.35	45	5.01		

15. Variable: Meaning Cues Synonym Type (F. W. Tests - Sentences)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	22.71	2	11.36	1.32	.28
B	109.48	2	54.74	6.37	.00
AB	42.51	4	10.63	1.24	.31
SE	386.50	45	8.59		

16. Variable: Meaning Cues Contrast Type (F. W. Tests - Sentences)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	67.60	2	33.80	5.00	.01
B	65.16	2	32.58	4.82	.01
AB	12.96	4	3.24	.48	.75
SE	304.17	45	6.76		

17. Variable: Meaning Cues Language-Experience Type (F. W. Tests - Sentences)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	6.34	2	3.17	.99	.38
B	10.79	2	5.39	1.69	.20
AB	12.22	4	3.05	.96	.44
SE	143.50	45	3.19		

18. Variable: Meaning Cues Cause-Effect Type (F. W. Tests - Sentences)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	31.82	2	15.91	1.54	.23
B	15.27	2	7.63	.74	.48
AB	45.18	4	11.29	1.09	.37
SE	465.01	45	10.33		

19. Variable: Meaning Cues Direct-Description Type (F. W. Tests - Sentences)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	23.60	2	11.80	1.50	.23
B	30.71	2	15.36	1.96	.15
AB	29.40	4	7.35	.94	.45
SE	353.34	45	7.85		

20. Variable: Meaning Cues Synonym Type (F. W. Tests - Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	8.99	2	4.50	2.26	.12
B	2.11	2	1.06	.53	.59
AB	8.22	2	2.06	1.03	.40
SE	89.50	45	1.99		

21. Variable: Meaning Cues Contrast Type (F. W. Tests - Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	29.78	2	14.89	4.34	.02
B	6.78	2	3.39	.99	.38
AB	1.78	4	.44	.13	.97
SE	154.50	45	3.43		

22. Variable: Meaning Cues Language-Experience Type (F. W. Tests - Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	8.44	2	4.22	2.01	.15
B	4.11	2	2.06	.98	.38
AB	14.44	4	3.61	1.72	.16
SE	94.50	45	2.10		

23. Variable: Meaning Cues Cause-Effect Type (F. W. Tests - Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	11.45	2	5.72	1.82	.17
B	7.11	2	3.56	1.13	.33
AB	9.77	4	2.44	.78	.55
SE	141.67	45	3.15		

24. Variable: Meaning Cues F. W. Tests - Sentences

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	631.13	2	315.56	4.46	.02
B	666.06	2	333.03	4.70	.01
AB	220.56	4	55.14	0.78	.55
SE	3187.25	45	70.83		

25. Variable: Meaning Cues F. W. Tests - Paragraphs

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	289.82	2	144.91	4.75	.01
B	83.82	2	41.91	1.37	.26
AB	72.39	4	18.10	0.59	.67
SE	1372.35	45	30.50		

26. Variable: Nouns (Missing words F. W. Tests - Sentences and Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	132.34	2	66.17	11.71	.00
B	129.80	2	64.90	11.48	.00
AB	7.54	4	1.88	.34	.85
SE	254.35	45	5.65		

27. Variable: Verbs (Missing words F. W. Tests - Sentences and Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	352.93	2	176.47	13.15	.00
B	274.06	2	137.03	10.21	.00
AB	3.06	4	.77	.06	.99
SE	603.68	45	13.42		

28. Variable: Adjectives (Missing words F. W. Tests - Sentences and Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	121.34	2	60.67	9.07	.00
B	153.46	2	76.73	11.47	.00
AB	35.89	4	8.97	1.34	.27
SE	300.84	45	6.69		

29. Variable: Adverbs (Missing words F. W. Tests - Sentences and Paragraphs)

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	166.27	2	83.13	7.52	.00
B	252.27	2	126.13	11.41	.00
AB	40.73	4	10.18	.92	.46
SE	497.34	45	11.05		

30. Variable: Reasoning F. W. Tests - Sentences

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	1020.71	2	510.36	14.76	.00
B	1225.59	2	612.80	17.72	.00
AB	90.73	4	22.68	0.66	.63
SE	1556.01	45	34.58		

31. Variable: Reasoning F. W. Tests - Paragraphs

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	361.01	2	180.50	14.09	.00
B	268.12	2	134.06	10.47	.00
AB	18.55	4	4.64	0.36	.83
SE	576.34	45	12.81		

32. Variable: Reasoning U. F. W. Tests - Sentences

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	60.04	2	30.02	4.89	.01
B	26.70	2	13.35	2.17	.13
AB	21.74	4	5.44	0.88	.48
SE	277.17	45	6.16		

33. Variable: Reasoning U. F. W. Tests - Paragraphs

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	106.82	2	53.41	8.58	.00
B	22.48	2	11.24	1.81	.18
AB	10.18	4	2.55	0.41	.80
SE	280.17	45	6.23		

34. Variable: Total Score U. F. W. Tests - Sentences

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	40.45	2	20.23	2.93	.06
B	10.13	2	5.06	0.73	.49
AB	45.11	4	11.28	1.63	.18
SE	311.18	45	6.92		

35. Variable: Total Score U. F. W. Tests - Paragraphs

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	95.27	2	47.63	6.45	.00
B	62.37	2	31.18	4.22	.02
AB	4.17	4	1.04	0.14	.97
SE	332.51	45	7.39		

36. Variable: Meaning Cue U. F. W. Tests - Sentences

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	9.34	2	4.67	1.09	.35
B	19.12	2	9.56	2.22	.12
AB	4.22	4	1.05	0.25	.91
SE	193.33	45	4.30		

37. Variable: Meaning Cue U. F. W. Tests - Paragraphs

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.
A	119.45	2	59.72	6.26	.00
B	48.44	2	24.22	2.54	.09
AB	62.43	4	15.61	1.64	.18
SE	429.01	45	9.53		

APPENDIX H

Single Factor Experiments with Repeated Measures

Table H.1

Single Factor Experiment With Reported Measures of Four Word Form Classes by Grade

Grade 4

Source of Variation	S.S.	D.F.	M.S.	F	Cons. Prob.
Between people	5878.25	17	345.78		
Within people	3404.25	54	63.04		
Treatments	287.06	3	95.69	1.57	.23
Residual	3117.19	51	61.12		
Total	9282.50	71			

Grade 6

Source of Variation	S.S.	D.F.	M.S.	F	Cons. Prob.
Between people	6416.69	17	377.45		
Within people	4625.59	54	85.67		
Treatments	178.63	3	59.54	.68	.42
Residual	4447.31	51	87.20		
Total	11042.63	71			

Grade 8

Source of Variation	S.S.	D.F.	M.S.	F	Cons. Prob.
Between people	3981.63	17	234.21		
Within people	3356.63	54	62.16		
Treatments	78.38	3	26.13	.41	.53
Residual	3278.25	51	64.28		
Total	7338.25	71			

Table H.2

Single Factor Experiment With Reported Measures for Five Types of Embedded Contextual Clues

Grade 4

Source of Variation	S.S.	D.F.	M.S.	F	Cons. Prob.
Between people	424.19	17	24.95		
Within people	961.60	72	13.36		
Treatments	489.18	4	122.29	17.60	.00
Residual	472.43	68	6.95		
Total	1385.79	89			

Grade 6

Source of Variation	S.S.	D.F.	M.S.	F	Cons. Prob.
Between people	498.99	17	29.35		
Within people	696.00	72	9.67		
Treatments	367.78	4	91.96	19.05	.00
Residual	328.18	68	4.83		
Total	1194.99	89			

Grade 8

Source of Variation	S.S.	D.F.	M.S.	F	Cons. Prob.
Between people	334.62	17	19.68		
Within people	673.60	72	9.36		
Treatments	247.55	4	61.89	9.88	.01
Residual	426.05	68	6.27		
Total	1008.22	89			

APPENDIX I

Intercorrelation Coefficients

1. Grade 4
2. Grade 6
3. Grade 8

Table I.1

Intercorrelation Matrix for Scores of Standardized Tests and Fourteen Dependent Variables for Grade 4 (N = 18)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. IQ		.732**	.564*	.555*	.386	.223	.363	.499*	.324	.290	.206	.213	-.017	.128	-.109	-.112	.191
2. Vocabulary (C.T.B.S.)			.650**	.649**	.642**	-.006	.532*	.618**	.505	.197	.372	.369	.207	.186	.338	.197	.396
3. Comprehension (C.T.B.S.)				.731**	.702**	-.008	.577*	.705**	.670**	.189	.452	.326	.149	.122	.108	.204	.392
4. F.W. Tests-Sent.					.728**	.064	.469*	.933***	.669**	.237	.520*	.326	.365	.312	.251	-.007	.202
5. F.W. Tests-Para.						.043	.379	.705**	.828***	.219	.256	.271	.463*	.128	.290	-.011	.153
6. U.F.W. Test-Sent.							.163	.037	.017	.894**	.098	.143	-.069	.317	-.003	-.031	-.038
7. U.F.W. Test-Para.								.486*	.244	.135	.881***	-.120	-.262	-.224	.155	.023	.051
8. Reasoning-F.W. Tests-Sent.									.753**	.187	.549*	.342	.300	.249	.356	.106	.252
9. Reasoning-F.W. Tests-Para.										.180	.224	.364	.255	.178	.374	-.019	.076
10. Reasoning-U.F.W. Test-Sent.											.014	.311	.000	.515*	.093	.067	.082
11. Reasoning-U.F.W. Test-Para.												-.177	-.166	-.203	.161	.050	-.005
12. Meaning Cues-F.W. Tests-Sent.													.443	.468*	.130	.525*	.621**
13. Meaning Cues-F.W. Tests-Para.														.463*	.236	.323	.365
14. Meaning Cues-U.F.W. Test-Sent.															.383	.326	.297
15. Meaning Cues-U.F.W. Test-Para.																.314	.250
16. Word Fluency (Test 1)																	.880***
17. Word Fluency (Total)																	

*p < .05 **p < .01 ***p < .001

Table I.2

Intercorrelation Matrix for Scores of Standardized Tests and Fourteen Dependent Variables for Grade 6 (N = 18)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. IQ		.695**	.633*	.636**	.652*	.119	.586*	.590**	.773**	.264	.549*	.477*	.486*	.164	.544*	.172	.292
2. Vocabulary (C.T.B.S.)			.732**	.618**	.558*	.184	.349	.434	.626**	.367	.595**	.488*	.617**	-.071	.505*	.409	.449
3. Comprehension (C.T.B.S.)				.695**	.431	.120	.323	.493*	.519*	.318	.434	.607**	.340	.211	.645**	.227	.476*
4. F.W. Tests-Sent.					.698**	.296	.440	.922***	.674**	.296	.293	.440	.665**	.370	.527*	.262	.451
5. F.W. Tests-Para.						.289	.690**	.674**	.919***	.171	.642**	.186	.738**	.030	.411	.331	.201
6. U.F.W. Test-Sent.							.165	.308	.239	.864***	.328	.446	.560*	.426	.045	.001	.019
7. U.F.W. Test-Para.								.497*	.794**	.203	.855***	.117	.397	-.177	.640**	.316	.160
8. Reasoning-F.W. Tests-Sent.									.692**	.248	.564*	.387	.621**	.423	.026	.158	.348
9. Reasoning-F.W. Tests-Para.										.210	.778***	.296	.683**	.026	.528**	.387	.367
10. Reasoning-U.F.W. Test-Sent.											.359	.594**	.477	.303	.247	.072	.214
11. Reasoning-U.F.W. Test-Para.												.293	.551*	-.106	.621**	.156	.269
12. Meaning Cues-F.W. Tests-Sent.													.455	.350	.214	-.136	.310
13. Meaning Cues-F.W. Tests-Para.														.184	.201	.069	.139
14. Meaning Cues-U.F.W. Test-Sent.															-.104	-.172	.201
15. Meaning Cues-U.F.W. Test-Para.																-.006	.316
16. Word Fluency (Test 1)																	.715***
17. Word Fluency (Total)																	

*p < .05 **p < .01 ***p < .001

Table I.3

Intercorrelation Matrix for Scores of Standardized Tests and Fourteen Dependent Variables for Grade 8 (N = 18)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. IQ		.848***	.777***	.659**	.538*	.483*	.523*	.646**	.473*	.396	.434	.241	.282	.144	.622**	.112	.143
2. Vocabulary (C.T.B.S.)			.650***	.803***	.555*	.478*	.597**	.727***	.607**	.414	.546*	.223	[illegible]	.226	.730**	.184	.235
3. Comprehension (C.T.B.S.)				.801**	.704**	.565**	.686**	.785***	.668**	.524*	.639**	.270	.446	.335	.646**	.340	.442
4. F.W. Tests-Sent.					.844**	.472	.594**	.855***	.757***	.564*	.489*	.452*	.604**	.526*	.651**	.369	.398
5. F.W. Tests-Para.						.470	.404	.757***	.870***	.531*	.282	.537*	.669**	.498	.595**	.329	.380
6. U.F.W. Test-Sent.							.687**	.398	.696**	.953***	.564**	.174	.352	.233	.357	.467*	.493*
7. U.F.W. Test-Para.								.563*	.469*	.496*	.920***	.205	.372	.424	.361	.494*	.546*
8. Reasoning-F.W. Tests-Sent.									.841***	.365	.529*	.657**	.747***	.451	.713**	.283	.366
9. Reasoning-F.W. Tests-Para.										.496*	.372	.747**	.802**	.456	.558*	.330	.359
10. Reasoning-U.F.W. Test-Sent.											.583**	.160	.342	.274	.375	.477*	.510*
11. Reasoning-U.F.W. Test-Para.												.205	.372	.300	.371	.458	.534*
12. Meaning Cues-F.W. Tests-Sent.													.904	.566**	.404	.456*	.355
13. Meaning Cues-F.W. Tests-Para.														.523*	.463	.419	.368
14. Meaning Cues-U.F.W. Test-Sent.															.162	.554*	.428
15. Meaning Cues-U.F.W. Test-Para.																.273	.249
16. Word Fluency (Test 1)																	.873***
17. Word Fluency (Total)																	

*p < .05 **p < .01 ***p < .001